MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT

FORSYTH – NORTHWEST: WEST SITE (SITE 1); MIDDLE SITE (SITE 2); EAST SITE (SITE 3); TREASURE COUNTY LINE SITE (SITE 4)
ROSEBUD COUNTY, MONTANA

PROJECT COMPLETED: 1999 (TREASURE COUNTY) & 2012 (EAST, WEST, AND MIDDLE)
MONITORING REPORT #6: DECEMBER 2017



Prepared for:

VISION ZERO
zero deaths · zero serious injuries
MONTANA DEPARTMENT OF TRANSPORTATION

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MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2017

FORSYTH – NORTHWEST MITIGATION SITE

WEST SITE (SITE 1); MIDDLE SITE (SITE 2); EAST SITE (SITE 3);
TREASURE COUNTY LINE SITE (SITE 4)

ROSEBUD COUNTY, MONTANA

Treasure County Line Constructed: 1999
Forsyth East, Middle, and West Constructed: 2012
MDT Project Number STPP 14-6 (9) 259 CN 4059 (Forsyth – Northwest)
Control Number 1396

USACE Number: NOW-2002-90-599 Control Number 1514 (Forsyth – Northwest)
NOW-2006-906-76 MTB (Forsyth – Northwest)

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December 2017

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TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 IMPACTS AND MITIGATION 1
1.2 GENERAL MITIGATION OBJECTIVES 4
1.3 MITIGATION SITES 5
1.3.1 West Site – Site 1 5
1.3.2 Middle Site – Site 2 6
1.3.3 East Site – Site 3 6
1.3.4 Treasure County Line Site – Site 4 6
2.0 METHODS 7
2.1 HYDROLOGY 7
2.2 VEGETATION 7
2.3 SOIL 8
2.4 WETLAND DELINEATION 8
2.5 WILDLIFE 9
2.6 FUNCTIONAL ASSESSMENT 9
2.7 PHOTOGRAPHIC DOCUMENTATION 9
2.8 GLOBAL POSITIONING SYSTEM DATA 9
2.9 MAINTENANCE NEEDS 9
3.0 RESULTS 10
3.1 WEST SITE – SITE 1 10
3.1.1 Hydrology 10
3.1.2 Vegetation 10
3.1.3 Soil 19
3.1.4 Wetland Delineation 19
3.1.5 Wildlife 20
3.1.6 Functional Assessment 21
3.1.7 Photographic Documentation 22
3.1.8 Maintenance Needs 22
3.1.9 Current Credit Summary 23
3.2 MIDDLE SITE – SITE 2 23
3.2.1 Hydrology 23
3.2.2 Vegetation 24
3.2.3 Soil 28
3.2.4 Wetland Delineation 28
3.2.5 Wildlife 28
3.2.6 Functional Assessment 29
3.2.7 Photographic Documentation 30
3.2.8 Maintenance Needs 30
3.2.9 Current Credit Summary 30
3.3 EAST SITE – SITE 3 31
3.3.1 Hydrology 31
3.3.2 Vegetation 31
3.3.3 Soil 37

TABLE OF CONTENTS (continued)

3.3.4 Wetland Delineation 38
3.3.5 Wildlife 38
3.3.6 Functional Assessment 39
3.3.7 Photographic Documentation 40
3.3.8 Maintenance Needs 40
3.3.9 Current Credit Summary 40
3.4 TREASURE COUNTY LINE SITE – SITE 4 41
3.4.1 Hydrology 41
3.4.2 Vegetation 41
3.4.3 Soil 46
3.4.4 Wetland Delineation 46
3.4.5 Wildlife 46
3.4.6 Functional Assessment 47
3.4.7 Photographic Documentation 48
3.4.8 Maintenance Needs 48
3.4.9 Current Credit Summary 48
3.5 COMPREHENSIVE CREDIT SUMMARY FOR FORSYTH – NORTHWEST 49
4.0 REFERENCES 51

LIST OF TABLES

TABLE PAGE

1-1 Wetland Impacts to be Mitigated at the Forsyth – Northwest Sites 4
1-2 Anticipated Wetland Mitigation Acreages for the Forsyth – Northwest Sites 4
3-1 Vegetation Species Observed at the West Site From 2013 Through 2017 11
3-2 T-1 Data Summary for the West Site From 2013 Through 2017 15
3-3 T-2 Data Summary for the West Site From 2013 Through 2017 17
3-4 Wetland Habitat Acreages Delineated at the West Site 20
3-5 Wildlife Species Observed at the West Site From 2013 Through 2017 20
3-6 Montana Wetland Assessment Method Summary for the West Site From 2013 Through 2017 22
3-7 Credit Summary for the West Site 23
3-8 Vegetation Species Observed at the Middle Site From 2013 Through 2017 25
3-9 T-1 Data Summary for the Middle Site From 2013 Through 2017 26
3-10 Wetland and Upland Habitat Acreages Delineated at the Middle Site From 2013 Through 2017 28
3-11 Wildlife Species Observed at the Middle Site From 2013 Through 2017 29

LIST OF TABLES (continued)

TABLE PAGE

3-12 Montana Wetland Assessment Method Summary for the Middle Site From 2013 Through 2017 30
3-13 Credit Summary for the Middle Site 31
3-14 Vegetation Species Observed at the East Site From 2013 Through 2017 32
3-15 T-1 Data Summary for the East Site From 2013 Through 2017 34
3-16 T-2 Data Summary for the East Site From 2013 Through 2017 36
3-17 Wetland/Upland Habitat Acreages Delineated at the East Site From 2013 Through 2017 38
3-18 Wildlife Species Observed at the East Site From 2013 Through 2017 38
3-19 Montana Wetland Assessment Method Summary for the East Site From 2013 Through 2017 40
3-20 Credit Summary for the East Site 41
3-21 Vegetation Species Observed at the Treasure County Line Site From 2013 Through 2017 42
3-22 T-1 Data Summary for the Treasure County Line Site From 2013 Through 2017 44
3-23 Wetland/Upland Habitat Acreages Delineated at the Treasure County Line Site From 2013 Through 2017 46
3-24 Wildlife Species Observed at the Treasure County Line Site From 2013 Through 2017 47
3-25 Montana Wetland Assessment Method Summary for the Treasure County Line Site From 2013 Through 2017 48
3-26 Credit Summary for the Treasure County Line Site 49
3-27 Credit/Debit Summary for the Forsyth – Northwest Project 50

LIST OF FIGURES

FIGURE PAGE

1-1 Locations of the Forsyth – Northwest Mitigation Sites: West (Site 1), Middle (Site 2), and East 2
1-2 Location of the Forsyth – Northwest Mitigation Site: Treasure County Line 3

LIST OF CHARTS

CHART PAGE

3-1 T-1 Map for the West Site Showing Vegetation Types From Transect Start (0 Foot) to End (282 Feet) From 2013 Through 2017 16

3-2 Length of Vegetation Communities Within T-1 at the West Site From 2013 Through 2017 16

3-3 T-2 Map for the West Site Showing Vegetation Types From Transect Start (0 Foot) to End (261 Feet) From 2013 Through 2017 18

3-4 Length of Vegetation Communities Within T-2 for the West Site From 2013 Through 2017 18

3-5 T-1 Map for the Middle Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (50 Feet) From 2013 Through 2017 27

3-6 Length of Vegetation Communities Within T-1 at the Middle Site From 2013 Through 2017 27

3-7 T-1 Map for the East Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (125 Feet) From 2013 Through 2017 35

3-8 Length of Vegetation Communities Within T-1 at the East Site From 2013 Through 2017 35

3-9 T-2 Map for the East Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (181 Feet) From 2013 Through 2017 36

3-10 Length of Vegetation Communities Within T-2 at the East Site From 2013 Through 2017 37

3-11 T-1 Map for the Treasure County Line Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (534 Feet) From 2013 Through 2017 45

3-12 Length of Vegetation Communities Within T-1 at the Treasure County Line Site From 2013 Through 2017 45

LIST OF APPENDICES

APPENDIX A. PROJECT AREA MAPS A-1

APPENDIX B. MONITORING FORMS B-1

APPENDIX C. PROJECT AREA PHOTOGRAPHS C-1

APPENDIX D. PROJECT PLAN SHEETS D-1

Cover: View looking south from the eastern end of wetland; *Populus deltoides* seedlings are visible on the upland bank.

1.0 INTRODUCTION

The 2017 Forsyth – Northwest (FNW) wetland monitoring report documents the fifth year of monitoring at the four FNW sites: (1) West, (2) Middle, (3) East, and (4) Treasure County Line. The FNW sites were developed to mitigate for a cumulative total of 8.98 acres of wetland impacts associated with two Montana Department of Transportation (MDT) highway construction projects: (1) the Volborg – North and South project constructed in 2004 and (2) the FNW project constructed in 2012. This report includes monitoring results for each of the four sites and a discussion of the mitigation credits developed for the FNW project. Because the Treasure County Line site has met its maximum wetland development potential, 2017 will be the final year of monitoring at this site. Monitoring of the other three sites will continue into 2018.

The four wetland mitigation sites are located in Rosebud County in the Sagebrush Steppe ecoregion of the Northwest Great Plains. The sites are within Watershed #14 – Middle Yellowstone. Three sites are located northwest of Forsyth along Montana Highway 12 at mile markers 262.3 (Site 3: East), 261.9 (Site 2: Middle), and 260 (Site 1: West) within the Big Porcupine Creek subbasin, as shown in Figure 1-1. Treasure County Line (Site 4) is located approximately 12 miles west of Forsyth at Interstate 94 mile marker 81.75. As shown in Figure 1-2, this site is situated southwest of the intersection of Interstate 94 and Reservation Road in the Lower Yellowstone River-Sunday Creek subbasin. Figures A-3 through A-10 (Appendix A) show the monitoring activity locations and mapped site features for each site, respectively. Appendix B contains the MDT Wetland Mitigation Site Monitoring forms, the US Army Corps of Engineers (USACE) Great Plains (GP) Regional Supplement Wetland Determination Data forms [USACE, 2010], and the 2008 MDT Montana Wetland Assessment Method (MWAM) forms [Berglund and McEldowney, 2008] for each site. Appendix C contains photographs of the project areas, and Appendix D includes the project plan sheets.

1.1 IMPACTS AND MITIGATION

Wetland impacts for the FNW project were identified in USACE permit #NWO-2006-90676-MTB and a wetland mitigation monitoring plan prepared by MDT and dated February 15, 2012. The wetland mitigation sites are intended to provide credits for impacts caused by the Volborg – North and South project (constructed in 2004) and the FNW project (completed in 2012). The Treasure County Line site was constructed in 1999 before the 2.18 acres of impact that resulted from the FNW project. The 2012 mitigation plan outlined that this site had produced 1.78 acres of wetland credit, which was awarded at a 1:1 credit ratio. Applying standard wetland compensatory mitigation ratios [USACE, 2005], 11 acres was the total area of required mitigation presented in the approved wetland mitigation plan. Table 1-1 provides a summary of the impacts, appropriate ratios, and anticipated mitigation requirements. The anticipated wetland mitigation acreages produced by the FNW project are listed by site and mitigation type in Table 1-2. Mitigation requirements and estimated credit development are discussed in more detail in Section 3.5 of this report.

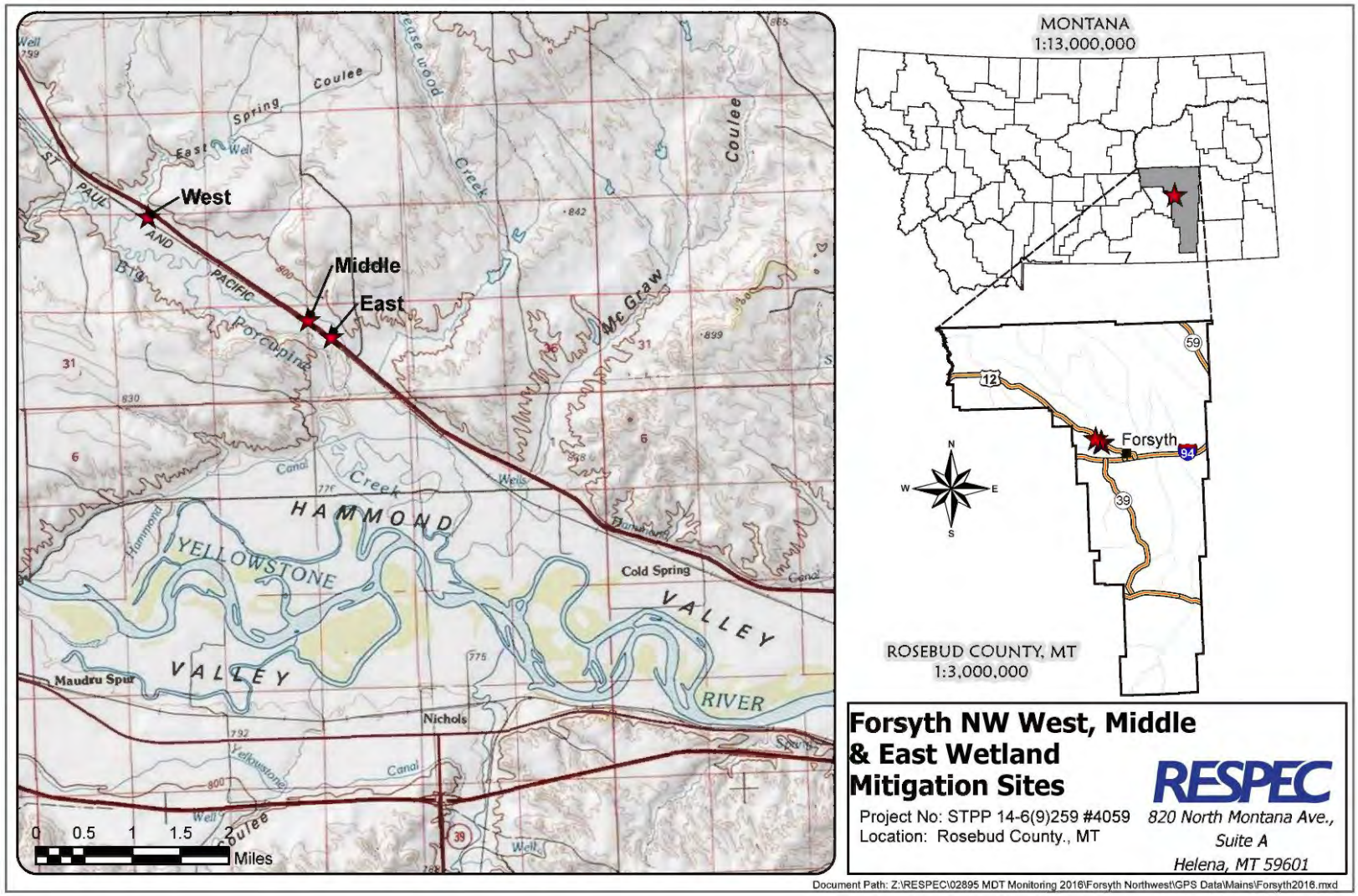


Figure 1-1. Locations of the Forsyth – Northwest Mitigation Sites: West (Site 1), Middle (Site 2), and East (Site 3).

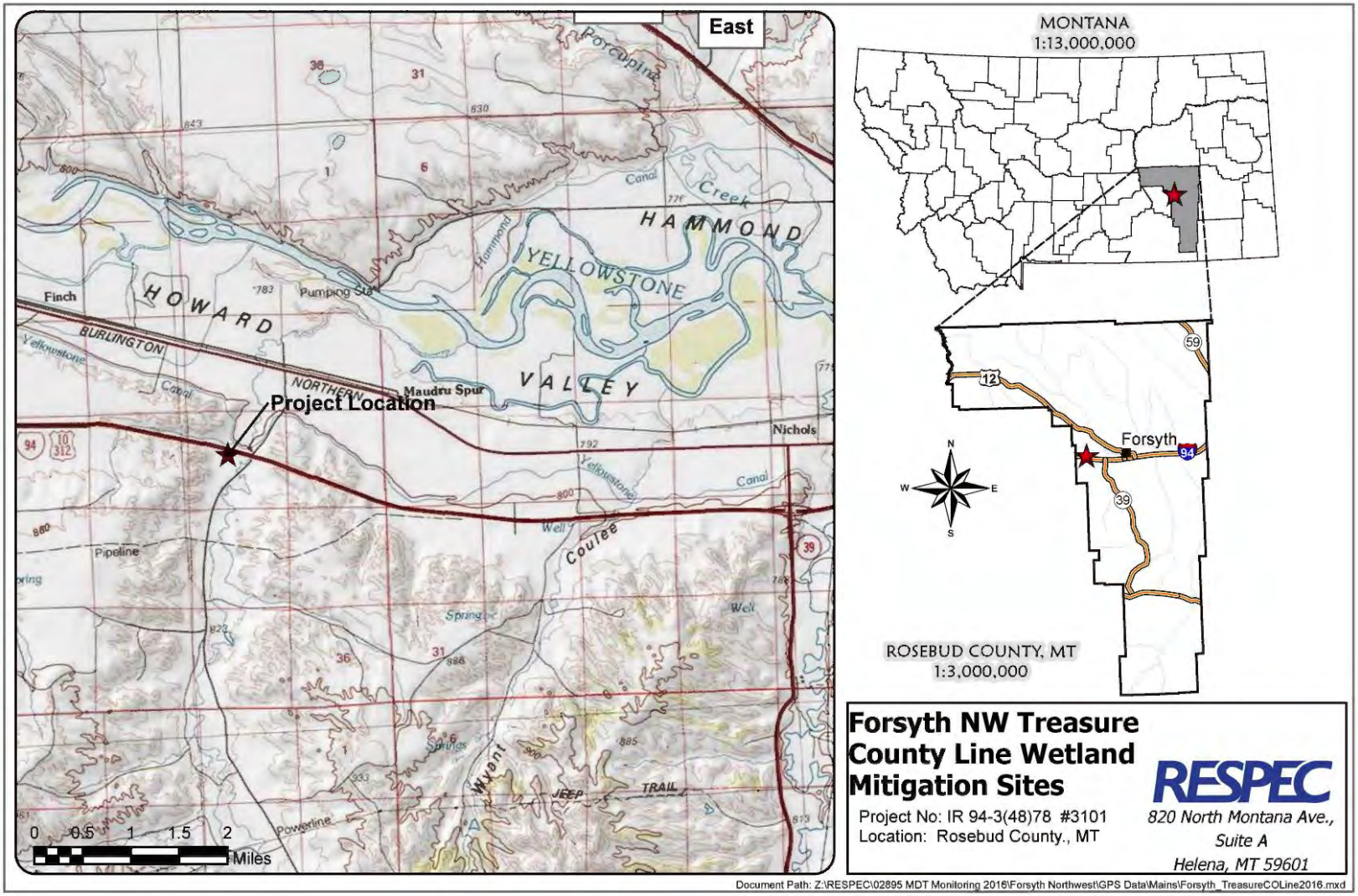


Figure 1-2. Location of the Forsyth – Northwest Mitigation Site: Treasure County Line (Site 4).

Table 1-1. Wetland Impacts to be Mitigated at the Forsyth – Northwest Sites

MDT Project	Impacts (acres)	Credits (acres)	Balance Remaining (acres)	Ratio	Mitigation (acres)
Volborg – North and South	6.80	0.00	6.80	1.5:1	10.20
Forsyth – Northwest	2.18	1.78	0.40	2:1	0.80
Total	**8.98**	**1.78**	**–**	**–**	**11.00**

Table 1-2. Anticipated Wetland Mitigation Acreages for the Forsyth – Northwest Sites

Wetland Mitigation Site	Expected Credits	
	Mitigation Type	Acre
Site 1: West	Creation	9.09
	Preservation	1.29
	Total for Site 1	**10.38**
Site 2: Middle	Creation	0.34
Site 3: East	Creation	1.07
Total for Sites 1, 2, and 3		**11.79**
Site 4: Treasure County Line	Previous Creation (Credit)	1.78
Total for All FNW Sites (1–4)		**13.57**

1.2 GENERAL MITIGATION OBJECTIVES

The MDT-developed performance standards and monitoring requirements (as presented in the approved mitigation plan) for the FNW sites are listed below. Aside from monitoring requirements, no quantitative metrics or criteria are associated with the success of these mitigation sites.

1. **Vegetation Community:**
   a. Establish permanent photo points
   b. Establish vegetation transects to monitor the development of each vegetative community and its diversity
   c. Develop a plant species list during each monitoring visit
   d. Plot vegetative communities on as-built plants
   e. Determine areal coverage of vegetative community from as-built plans, aerial photographs, or by conventional or global positioning system (GPS) survey every other year, starting in 2013
   f. Monitor for and control invasive weed species.
2. **Soils:**
   a. Establish monitoring points for hydric soil development
   b. Monitor and document the development of hydric soils by using a Munsell Soil Chart
   c. Document the progression of reducing soil conditions as the soil transitions from an aerobic state to an anaerobic (hydric) state.

3. **Hydrology:**
    a. Delineate inundated areas no earlier than the second weekend of June every other year, starting in 2013
    b. Survey and document the hydrology within the new wetland area no earlier than the second weekend of June every other year, starting in 2013
    c. Measure the horizontal and vertical extent of the soil saturation zone at the margins of the wetlands.
4. **Wildlife Community:**
    a. **Birds:** Create and maintain a cumulative list of bird species observed
    b. **Mammals:** Create and maintain a list of mammalian species observed either directly or indirectly (e.g., tracks and scat) during the biennial monitoring visits
    c. **Herptiles:** Create and maintain a list of the amphibian and reptile species observed either directly or indirectly (e.g., tracks and nests) during the biennial monitoring visits.
5. **MDT Functional Assessment:**
    a. A formal MDT Functional Assessment will be completed during each monitoring period.
6. **Routine Wetland Determination:**
    a. A Routine Wetland Determination form will be completed during each monitoring period according to the 1987 *Corps of Engineers Wetland Delineation Manual* (1987 Wetland Manual) [Environmental Laboratory, 1987] and to the terms in the most applicable USACE 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (2010 GP Regional Supplement) [USACE, 2010].

1.3 MITIGATION SITES

The following sections provide a general discussion of the four wetland mitigation sites. The discussion includes location, site topography, mitigation objectives, and targeted wetland community goals.

1.3.1 West Site – Site 1

The West site is a 13.71-acre site owned by MDT and located at the mouth of East Spring Coulee in the floodplain of Big Porcupine Creek. The site is intended to provide 10.38 acres of compensatory wetland mitigation. Approximately 1.29 acres of preexisting wetlands will be preserved at this site. The monitoring area boundary is shown on Figures A-3 and A-4 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavating new wetland areas with undulating bottoms
- Creating emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix
- Constructing a water retention dike on the eastern end of the project site.

The targeted wetland community types included emergent, scrub/shrub, and forested classes dominated by herbaceous hydrophytes, willows, and cottonwoods. Site construction was completed in summer 2012, and the revegetation was completed from August through October 2012.

1.3.2 Middle Site – Site 2

The Middle site is a 1.80-acre site owned by MDT. The site is adjacent to US Highway 12 and situated among old meander scars across the Big Porcupine Creek floodplain. This area is intended to provide 0.34 acre of compensatory wetland mitigation. The monitoring area boundary is shown on Figures A-5 and A-6 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavating new wetland areas with undulating bottoms
- Creating emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix.

The proposed wetland community for this site is a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in the summer of 2012, and the revegetation was completed from August through October in 2012.

1.3.3 East Site – Site 3

The East site is a 2.74-acre site owned by MDT. The site is located approximately 1,000 feet from the Middle site and is directly adjacent to US Highway 12. The East site is intended to provide 1.07 acres of compensatory wetland mitigation. The monitoring area boundary is shown on Figures A-7 and A-8 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavating new wetland areas with undulating bottoms
- Creating emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix.

The proposed wetland community for this site is a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in the summer of 2012, and the revegetation was completed from August through October in 2012.

1.3.4 Treasure County Line Site – Site 4

The Treasure County Line site is a 5.89-acre site owned by MDT. The site is located adjacent to US Interstate 94 and an existing wetland complex along Reservation Creek. This site is intended to provide 1.78 acres of compensatory wetland mitigation. The monitoring area boundary is shown on Figures A-9 and A-10 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavating new wetland areas with undulating bottoms
- Creating emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated areas and seeding with wetland grass mix.

The proposed wetland community for this site is a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in 1999.

2.0 METHODS

All four sites were monitored on July 24, 2017. Information contained in the Wetland Mitigation Site Monitoring forms and Wetland Determination Data forms was recorded in the field during the site investigation (Appendix B). Monitoring activity locations for the West, Middle, East, and Treasure County Line sites were mapped with a GPS as illustrated on Figures A-3, A-5, A-7, and A-9, respectively (Appendix A). The collected information included wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data, bird- and wildlife-use documentation, photographic documentation, functional assessments, and a nonengineering examination of the infrastructure established within the mitigation project area.

2.1 HYDROLOGY

The presence of hydrological indicators as outlined on the Wetland Determination Data forms was documented at two data points within the West site, two data points within the Middle site, three data points within the East site, and two data points within the Treasure County Line site. Hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded onto Wetland Determination Data forms (Appendix B). Hydrologic assessments allow evaluation of mitigation goals that address inundation and saturation requirements.

Technical criteria for wetland hydrology guidelines have been established as “permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season) during the growing season” [USACE, 2010]. Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are classified as jurisdictional wetlands. The growing season is defined for purposes of this report as the number of days when a 50 percent probability exists that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit [Environmental Laboratory, 1987]. Temperature data recorded for the meteorological station at Forsyth, Montana (243098), have a median (5 years in 10) growing season length of 156 days. Areas defined as wetlands would require 19.5 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria. Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data were recorded on the Wetland Determination Data forms (Appendix B). Precipitation data from the Forsyth, Montana (243098), meteorological station were also reviewed and compared to long-term averages for this site.

2.2 VEGETATION

The boundaries of general dominant-species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2016 aerial photographs. The percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (< 1 percent), 1 (1–5 percent), 2 (6–10 percent), 3 (11–20 percent), 4 (21–50 percent), and 5 (> 50 percent) (Appendix B). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figures A-4, A-6, A-8, and A-10, Appendix A).

Temporal changes in vegetation were evaluated by annually assessing static belt transects (Figures A-3, A-5, A-7, and A-9, Appendix A). Vegetation composition was assessed and recorded along vegetation belt transects that were established at all of the sites during the 2013 reconnaissance site visits. Transects are 10 feet wide and vary in length at each site. The transect endpoints were recorded with a resource-grade GPS unit.

Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species within the belt transect was estimated using the same values and cover ranges used for the vegetation community polygon data (Appendix B). Photographs were taken at the transect endpoints during the monitoring event (Appendix C).

The *Montana Noxious Weed List* (February 2017), which was prepared by the Montana Department of Agriculture [2017], was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field and mapped on the aerial photograph with noxious weed species color-coded (Figure A-3, Appendix A). Cover classes are represented by a T, L, M, or H, which represent less than 1 percent, 1–5 percent, 6–25 percent, and 26–100 percent, respectively. The total cover by noxious weeds overall across the site was estimated based on the noxious weed cover classes and project acreage.

2.3 SOIL

Soil information was obtained from the *Web Soil Survey for Rosebud County* [US Department of Agriculture, 2011] and in soil core descriptions. Soil cores were excavated by using a sharpshooter shovel and evaluated according to procedures outlined in the 1987 Wetland Manual and 2010 GP Regional Supplement. A description of the soil profile, including hydric indicators when present, was recorded on the Wetland Determination Data form for each profile (Appendix B).

2.4 WETLAND DELINEATION

Waters of the US, including special aquatic sites and jurisdictional wetlands, were delineated throughout the project area in accordance with criteria established in the 1987 Wetland Manual and 2010 GP Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology described in the 2010 GP Regional Supplement must be satisfied to delineate a representative area as jurisdictional. The name and indicator status of plant species was derived from the 2016 national wetland plant list (NWPL) [Lichvar et al., 2016]. A routine level-2 on-site determination method [Environmental Laboratory, 1987] was used to delineate jurisdictional areas within the project boundaries. The information was recorded onto Wetland Determination Data forms (Appendix B).

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross-referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the

parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was classified as an atypical situation, potential problem area, or special aquatic site (i.e., mudflat). The wetland boundary was surveyed and identified on the 2017 aerial photographs. Wetland areas were estimated using GIS methods.

2.5 WILDLIFE

Observations and other positive indicators of use by mammal, reptile, amphibian, and bird species were recorded on the Wetland Mitigation Site Monitoring forms during each of the site visits. Indirect-use indicators, including tracks, scat, burrows, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive list of wildlife species observed on the sites each year is compiled and updated annually in each report.

2.6 FUNCTIONAL ASSESSMENT

The MDT MWAM [Berglund and McEldowney, 2008] was used to evaluate functions and values on the sites. This method provides an objective means of assigning an overall rating to wetlands and provides regulators with a means of assessing mitigation success based on wetland functions. Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and relate to ecological significance without regard to subjective human values [Berglund and McEldowney, 2008]. Field data for this assessment were collected during the site visit. One MWAM form was completed at each mitigation site (i.e., assessment area [AA]) (Appendix B).

2.7 PHOTOGRAPHIC DOCUMENTATION

Monitoring at photo points provided supplemental information that document wetland and upland conditions, site trends, current land uses that surround the site, and the status of the vegetation transects. Photographs were taken at established photo points and at transect endpoints throughout each of the sites during the field survey (Appendix C). Photo-point locations were recorded with a resource-grade GPS unit (Figures A-3, A-5, A-7, and A-9, Appendix A).

2.8 GLOBAL POSITIONING SYSTEM DATA

Site features and survey points were collected using a resource-grade (± 1 meter) Trimble R1 GNSS GPS receiver and companion Android tablet during the 2016 monitoring season. The collected data were then transferred to a personal computer, imported into GIS, and projected in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with GPS included fence boundaries, photo points, transect endpoints, and wetland data points.

2.9 MAINTENANCE NEEDS

Channels, engineered structures, fencing, and other features were examined during the site visit for obvious signs of breaching, damage, or other problems. This examination was cursory and not an engineering-level structural inspection.

3.0 RESULTS

3.1 WEST SITE – SITE 1

3.1.1 Hydrology

The average total annual precipitation recorded at the Forsyth, Montana, weather station (243098) from 1975 through 2016 was 14.6 inches [Western Regional Climate Center, 2017]. The precipitation between January and August of 2016 totaled 16.77 inches, which is well above the long-term average of 12.03 inches. In 2017, precipitation between January and August totaled only 7.59 inches, which is the fifth driest year since 1975. In coordination with the Montana Governor's Drought and Water Supply Advisory Committee, the Montana State Library publishes monthly maps of moisture by county. The July 2017 map shows Rosebud County to be severely dry. Additionally, the governor of Montana issued Executive Order 5-2017 on June 23, 2017, declaring a drought emergency to exist in eastern Montana. Later, under Executive Order No. 6-2017, the governor declared a drought disaster in Rosebud County and 13 other counties in Eastern Montana [DNRC, 2017].

The main source of hydrology at the West site is a seasonal high-water table and occasional overbank flooding from East Spring Coulee and Big Porcupine Creek. Surface runoff from East Spring Coulee flows directly into the site. Additional hydrology is provided by surface water from precipitation events.

Mitigation activities included excavating to lower the ground surface of uplands to match adjacent existing wetlands and the construction of a dike across two wetland/ephemeral swales along the lower end of the site (east side) to impound periodic surface water. High surface-water flows at the site in 2013 breached a portion of the dike. MDT completed repairs on the structure in July 2013. This failure was repeated in 2014. During the spring of 2017, the dike was repaired (Appendix C).

Because of the spring dike construction, monitoring was not conducted until late July. No surface water was observed at the West site. Other evidence of hydrology observed within the West site included water marks, salt crust, and geomorphic position.

Two data points (DP-1W and DP-1U) were assessed to determine the upland and wetland boundaries (Wetland Determination Data forms, Appendix B). DP-1W is located south of Transect 1 (T-1) end. Positive indicators of wetland hydrology at DP-1W included soil cracks, sparsely vegetated concave surface, saturation visible on aerial imagery, and geomorphic position. No primary or secondary indicators of wetland hydrology were observed at DP-1U, which is located in upland community Type 6 – *Pascopyrum smithii*/*Bromus tectorum*.

3.1.2 Vegetation

A total of 79 plant species were identified during the 2013 through 2017 field surveys, as listed in Table 3-1. Of the 79 species, 12 were new in 2017 and included 6 wetland species and 6 upland species. The indicator status for all of the plants was derived from the 2016 NWPL [Lichvar et al.,

Table 3-1. Vegetation Species Observed at the West Site From 2013 Through 2017 (Page 1 of 2)

Scientific Names	Common Names	GP Indicator Status[a]
Agropyron cristatum	Crested Wheatgrass	NL
Alisma triviale	Northern Water-Plantain	OBL
Amaranthus retroflexus	Red-Root	FACU
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Aquatic macrophytes	Aquatic macrophytes	NL
Artemesia biennis	**Biennial Wormwood**	**FACU**
Asclepias speciose	Showy Milkweed	FAC
Atriplex argentea	Silverscale	FAC
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	California Brome	NL
Bromus inermis	Smooth Brome	UPL
Bromus arvensis	Japanese Brome	NL
Bromus tectorum	Cheatgrass	NL
Carex sp.	Sedge	NL
Chenopodium album	Lamb's Quarters	FACU
Chenopodium rubrum	Red Goosefoot	OBL
Cichorium intybus	Chicory	FACU
Cirsium arvense	Canada Thistle	FACU
Comandra umbellata	**Bastard-Toadflax**	**UPL**
Convolvulus arvensis	Field Bindweed	NL
Deschampsia caespitosa	Tufted Hair Grass	FACW
Descurainia sophia	Herb Sophia	NL
Distichlis spicata	**Coastal Saltgrass**	**FACW**
Echinochloa crus-galli	Large Barnyard Grass	FAC
Elaeagnus angustifolia	Russian Olive	FACU
Eleocharis palustris	Common Spike-Rush	OBL
Elymus canadensis	Nodding Wild Rye	FACU
Elymus hispidus	Intermediate Wheatgrass	NL
Elymus lanceolatus	**Streamside Wild Rye**	**FACU**
Elymus repens	Creeping Wild Rye	FACU
Elymus trachycaulus	Slender Wild Rye	FACU
Euphorbia esula	Leafy Spurge	NL
Glyceria elata	Tall Mannagrass	OBL
Glycyrrhiza lepidota	American Licorice	FACU
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum brachyantherum	Meadow Barley	FAC
Hordeum jubatum	Foxtail Barley	FACW
Hordeum marinum	Seaside Barley	FACU
Iva axillaris	**Deer-Root**	**FAC**
Lactuca serriola	Prickly Lettuce	FAC

Table 3-1. Vegetation Species Observed at the West Site From 2013 Through 2017 (Page 2 of 2)

Scientific Names	Common Names	GP Indicator Status[(a)]
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	Prairie Flax	NL
Melilotus officinalis	Yellow Sweet Clover	FACU
Muhlenbergia asperifolia	**Alkali Muhly**	**FACW**
Nassella viridula	**Green Needle Grass**	**NL**
Pascopyrum smithii	Western Wheatgrass	FACU
Phalaris arundinacea	Reed Canary Grass	FACW
Poa compressa	Flat-Stem Bluegrass	FACU
Poa palustris	Fowl Bluegrass	FACW
Poa pratensis	Kentucky Bluegrass	FACU
Polygonum aviculare	Yard Knotweed	FACU
Populus deltoides	Eastern Cottonwood	FAC
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Ratibida columnifera	**Mexican Coneflower**	**NL**
Ribes aureum	Golden Currant	FACU
Ribes cereum	**Wax Currant**	**NL**
Rosa arkansana	Prairie Rose	FACU
Rumex crispus	Curly Dock	FAC
Sagittaria cuneate	Arum-Leaf Arrowhead	OBL
Salicornia rubra	**Red Saltwort**	**OBL**
Salix fragilis	**Fragile Willow**	**FAC**
Sarcobatus vermiculatus	Greasewood	FAC
Schedonorus pratensis	False Meadow Rye Grass	FACU
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Setaria pumila	Yellow Bristle Grass	FACU
Sonchus arvensis	Field Sow-Thistle	FAC
Spartina pectinata	Freshwater Cordgrass	FACW
Sporobolis airoides	**Alkali-Sacaron**	**FAC**
Symphoricarpos albus	Common Snowberry	UPL
Tamarix chinensis	Salt-cedar	NL
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-beard	NL
Typha angustifolia	Narrow-Leaf Cattail	OBL
Typha latifolia	Broad-Leaf Cattail	OBL
Xanthium strumarium	Rough Cockleburr	FAC

(a) 2016 NWPL [Lichvar et al., 2016].
New species that were identified in 2017 are **bolded.**

2016]. The mitigation area contains several mature eastern cottonwoods (*Populus deltoides*) near the center of the site and a few large fragile willows (*Salix fragilis*) along the undisturbed existing

wetland swales. Twelve vegetation communities have been mapped across the site from 2013 through 2017. In general, the communities can be classified as undisturbed wetland, transitional wetland, undisturbed upland, and disturbed upland. The 12 community types on this site include the following:

- Upland Type 1 – *Bromus tectorum*/*Sarcobatus vermiculatus*
- Upland Type 5 – *Symphoricarpos albus*/*Pascopyrum smithii*
- Upland Type 6 – *Pascopyrum smithii*/*Bromus tectorum*
- Upland Type 7 – *Puccinellia nuttalliana*/*Hordeum jubatum*
- Wetland Type 8 – *Typha latifolia*/*Eleocharis palustris*
- Wetland Type 9 – *Eleocharis palustris*/Open Water
- Wetland Type 10 – *Hordeum jubatum*/*Puccinellia nuttalliana*
- Upland Type 11 – *Pascopyrum smithii/Elymus repens*
- Wetland Type 12 – *Hordeum jubatum/Elymus trachycaulus*
- Upland Type 13 – *Elymus trachycaulus/Bromus tectorum*
- Upland Type 14 - *Pascopyrum smithii/Elymus trachycaulus*
- Wetland Type 15 – *Puccinellia nuttalliana/Schoenoplectus.*

The species composition for each community is included on the West site's Wetland Mitigation Site Monitoring form (Appendix B) and discussed below. Vegetation community boundaries are shown in Figure A-4 (Appendix A).

Upland community Type 1 – *Bromus tectorum/Sarcobatus vermiculatus* (cheatgrass/greasewood) is located in undisturbed upland on the side slope of the railroad grade along the southwestern boundary. This community decreased in 2015 because of differences in species composition and their associated cover classes, which created new upland community Types 5 – *Symphoricarpos albus/Pascopyrum smithii* and 6 – *Pascopyrum smithii/Bromus tectorum*. Dominant species included cheatgrass (*Bromus tectorum*), greasewood (*Sarcobatus vermiculatus*), western wheatgrass (*Pascopyrum smithii*), and false meadow rye grass (*Schedonorus pratensis*).

Upland community Type 5 – *Symphoricarpos albus*/*Pascopyrum smithii* (snowberry/western wheatgrass) was located in undisturbed upland along the southern boundary of the project area. This community replaced a portion of upland community Type 1 because of a shift in species composition and their associated cover classes. Dominant species included common snowberry (*Symphoricarpos albus*), western wheatgrass, greasewood, and Japanese brome (*Bromus arvensis*).

Upland community Type 6 – *Pascopyrum smithii*/*Bromus tectorum* (western wheatgrass/cheatgrass) is located in undisturbed upland adjacent to Montana Highway 12 along the northeastern boundary. This community replaced a portion of upland community Type 1 because of changes in species composition and their associated cover classes. The community was dominated by cheatgrass, yellow sweet clover (*Melilotus officinalis*), and western wheatgrass.

Upland community Type 7 – *Puccinellia nuttalliana/Hordeum jubatum* (Nutall's alkali grass/foxtail barley) was identified in an upland located within the excavated footprint. This community replaced community Type 2 – *Helianthus annuus/Bassia scoparia* in 2015 as the primary colonizing species decreased in dominance and more persistent, perennial plants increased in cover. The most abundant species in the community are Nuttall's alkali grass (*Puccinellia nuttalliana*), foxtail barley (*Hordeum jubatum*), and yellow sweet clover.

Wetland community Type 8 – *Typha latifolia*/*Eleocharis palustris* (broad-leaf cattail/common spike-rush) was originally designated as undisturbed, preexisting wetland community Type 3 – *Spartina pectinata/Eleocharis palustris* in previous surveys. The community was dominated by common spike-rush (*Eleocharis palustris*) and broad-leaf cattail (*Typha latifolia*). Type 8 includes approximately 20 percent cover of shallow (fewer than 1.5 feet) inundation during spring conditions; however, the site was dry at the surface during the late July monitoring event.

Wetland community Type 9 – *Eleocharis palustris*/Open Water (common spike rush/open water) replaced disturbed wetland community Type 4 – *Eleocharis palustris/Chenopodium album* from previous surveys. The most abundant species in the community were common spike-rush, aquatic macrophytes, red goosefoot (*Chenopodium rubrum*), and saltmarsh club-rush (*Schoenoplectus maritimus*). Open water that is normally present during the spring was absent during the monitoring event because of drought and mid-summer conditions.

Wetland community Type 10 – *Hordeum jubatum/Puccinellia nuttalliana* (foxtail barley/Nutall's alkali grass) was observed in 2015 as a new wetland community type located in an area that was previously upland community Type 2 – *Helianthus annuus/Bassia scoparia*. The most abundant species in the community were foxtail barley and freshwater cordgrass (*Spartina pectinate*).

Wetland community Type 11 – *Pascopyrum smithii/Elymus repens* (western wheatgrass/creeping wild rye) was observed in 2017 in areas that were formerly upland community Type 7 – *Puccinellia nuttalliana/Hordeum jubatum*. The most abundant species in the community were western wheatgrass, lamb's quarters (*Chenopodium album*), and creeping wild rye.

Wetland community Type 12 – *Hordeum jubatum/Elymus trachycaulus* (foxtail barley/slender wild rye) is developing on the southeastern end of community Type 9. The most abundant species in the community were foxtail barley, American licorice (*Glycyrrhiza lepidota*), and slender wild rye (*Elymus trachycaulus*).

Wetland community Type 13 – *Elymus trachycaulus/Bromus tectorum* (slender wild rye/cheatgrass) has developed within the southeastern center of the site. The most abundant species in the community were cheatgrass, slender wild rye, and streamside wild rye (*Elymus lanceolatus*).

Wetland community Type 14 – *Pascopyrum smithii/Elymus trachycaulus* (western wheatgrass/slender wild rye) has developed within the southeastern center of the site. The most abundant species in the community were slender wild rye and western wheatgrass.

Wetland community Type 15 – *Puccinellia nuttalliana/Schoenoplectus maritimus* (Nutall's alkali grass/saltmarsh club-rush) has developed along the northeastern edge of community Type 9. The most abundant species in the community were saltmarsh club-rush and Nutall's alkali grass.

Vegetation cover was measured along two transects at the West site in 2017 (Figure A-3, Appendix A). Data recorded on T-1 are summarized in Table 3-2 and Charts 3-1 and 3-2. Photographs of the West transect start and end points are provided in Appendix C. T-1 is located in the eastern half of the site and extends 282 feet from southwest to northeast, with intervals that alternate between upland community Types 5 – *Symphoricarpos albus/Pascopyrum smithii*, 6 – *Pascopyrum smithii/Bromus tectorum*, and 11 – *Pascopyrum smithii/Elymus repens*; bare ground (dike post-construction disturbance); and wetland community Types 8 – *Typha latifolia/Eleocharis palustris* and 12 – *Hordeum jubatum/Elymus trachycaulus*. This transect spans the 2017 construction zone created as part of the dike repair on this end of the site. Hydrophytic vegetation communities composed 34 percent of T-1 in 2017, which is a decrease of 3 percent since 2016 and an increase of 15 percent since 2014. Bare ground in the area of construction disturbance comprised 41 percent of the transect; the area was seeded by MDT. Wetland habitat is expected to increase along this transect in the future following the 2017 dike repair, which will serve to impound water and saturate this area.

Table 3-2. T-1 Data Summary for the West Site From 2013 Through 2017

Monitoring Year	2013	2014	2015	2016	2017
Transect Length (feet)	**282**	**282**	**282**	**282**	**282**
Vegetation Community Transitions Along Transect	6	6	7	7	5
Vegetation Communities Along Transect	3	3	5	5	5
Hydrophytic Vegetation Communities Along Transect	1	1	2	4	2
Total Vegetative Species	27	35	37	26	18
Total Hydrophytic Species	10	10	10	5	4
Total Upland Species	17	25	27	21	14
Estimated % Total Vegetative Cover	75	80	80	90	46
Estimated % Unvegetated	25	20	20	10	54
% Transect Length Comprising Hydrophytic Vegetation Communities	15.6	18.8	37	37	34
% Transect Length Comprising Upland Vegetation Communities	84.4	81.2	63	63	66
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0

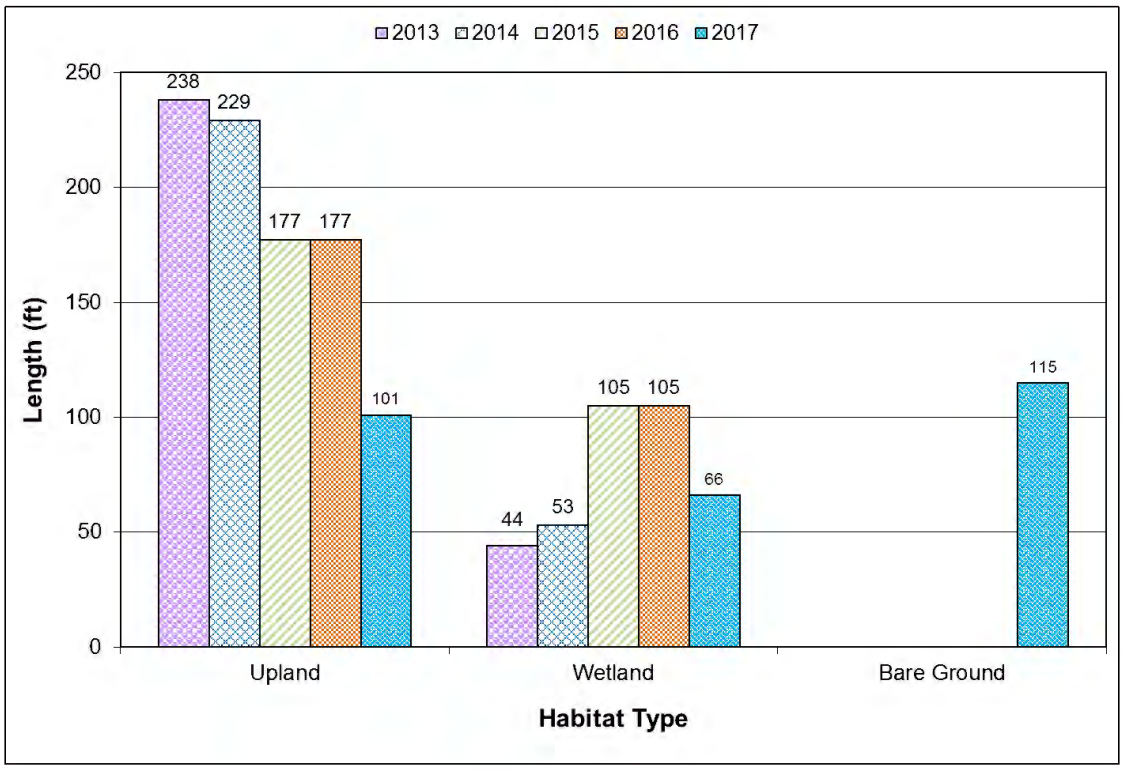


Chart 3-1. T-1 Map for the West Site Showing Vegetation Types From Transect Start (0 Foot) to End (282 Feet) From 2013 Through 2017.

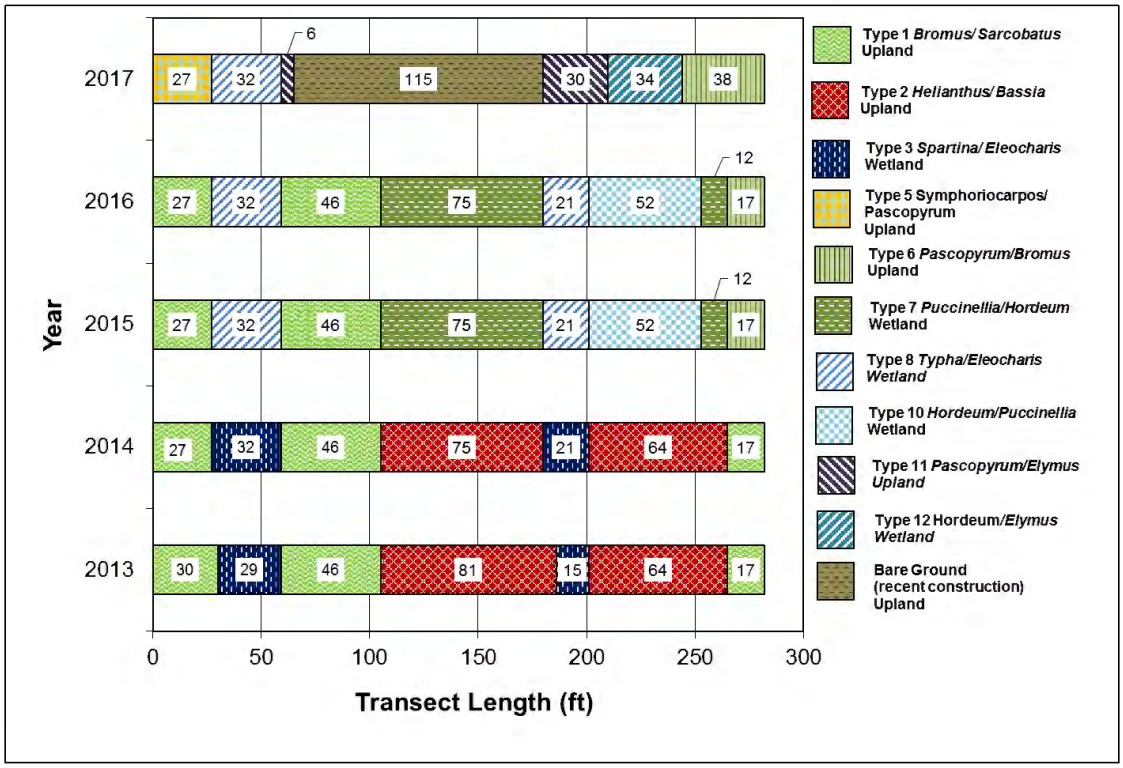


Chart 3-2. Length of Vegetation Communities Within T-1 at the West Site From 2013 Through 2017.

Transect 2 (T-2) data are summarized in Table 3-3 and Charts 3-3 and 3-4.T-2 is located in the western half of the site and extends 261 feet from southwest to northeast, with intervals that alternate between upland community Types 5 and 6 and wetland community Types 9 – *Eleocharis plaustris*/Open Water and 15 – *Puccinellia nuttalliana/Schoenoplectus*. Hydrophytic vegetation communities composed 87 percent of T-2 in 2017. A transition from pioneer to climax wetland community is also occurring along T-2, where weedy species and excavated bare soils in 2014 have been replaced by over 80 percent cover of an obligate wetland species (*Eleocharis*). Wetland area may increase 2–4 feet along the transect in future years because of dike repair.

Table 3-3. T-2 Data Summary for the West Site From 2013 Through 2017

Monitoring Year	2013	2014	2015	2016	2017
Transect Length (feet)	**261**	**261**	**261**	**261**	**261**
Vegetation Community Transitions Along Transect	2	2	2	2	3
Vegetation Communities Along Transect	2	2	3	3	4
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	2
Total Vegetative Species	21	26	29	28	19
Total Hydrophytic Species	8	11	9	8	9
Total Upland Species	13	15	20	20	10
Estimated % Total Vegetative Cover	10	20	20	82	92
Estimated % Unvegetated	90	80	80	13	8
% Transect Length Comprising Hydrophytic Vegetation Communities	87	87	87	87	87
% Transect Length Comprising Upland Vegetation Communities	13	13	13	13	13
% Transect Length Comprising Unvegetated Open Water[(a)]	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0

(a) Water within Type 8 was less than 1.5 feet deep and is considered a “shallow inundation.”

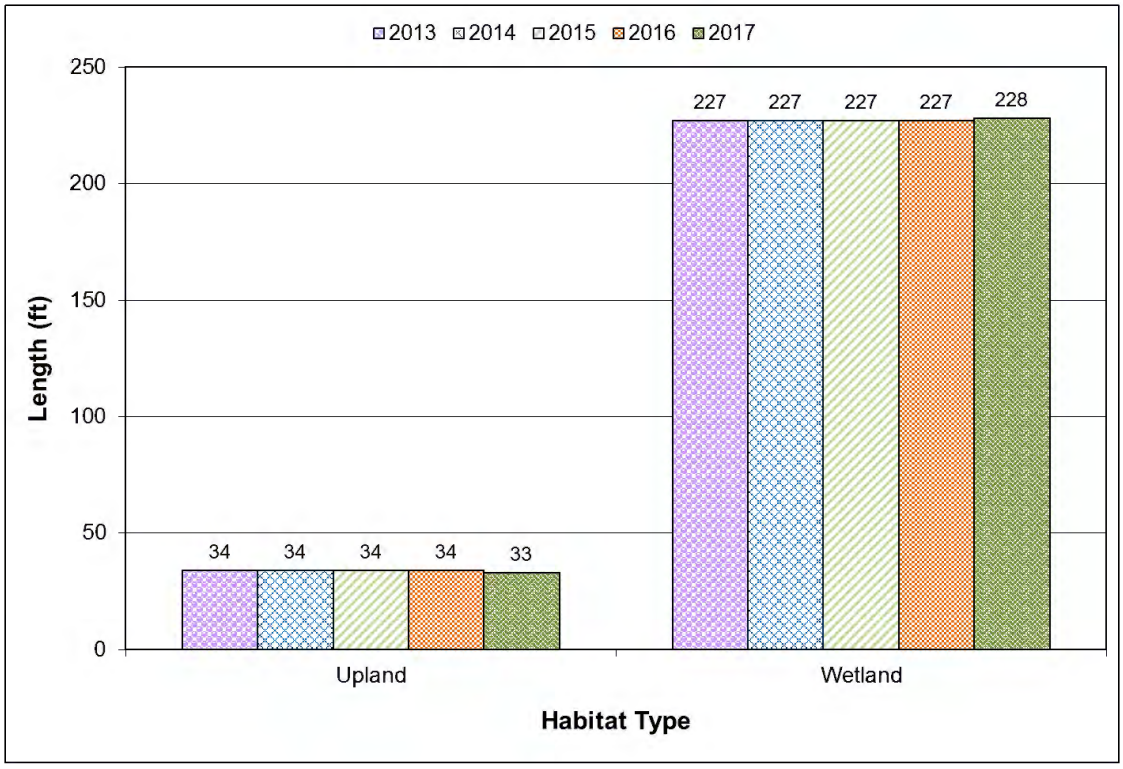


Chart 3-3. T-2 Map for the West Site Showing Vegetation Types From Transect Start (0 Foot) to End (261 Feet) From 2013 Through 2017.

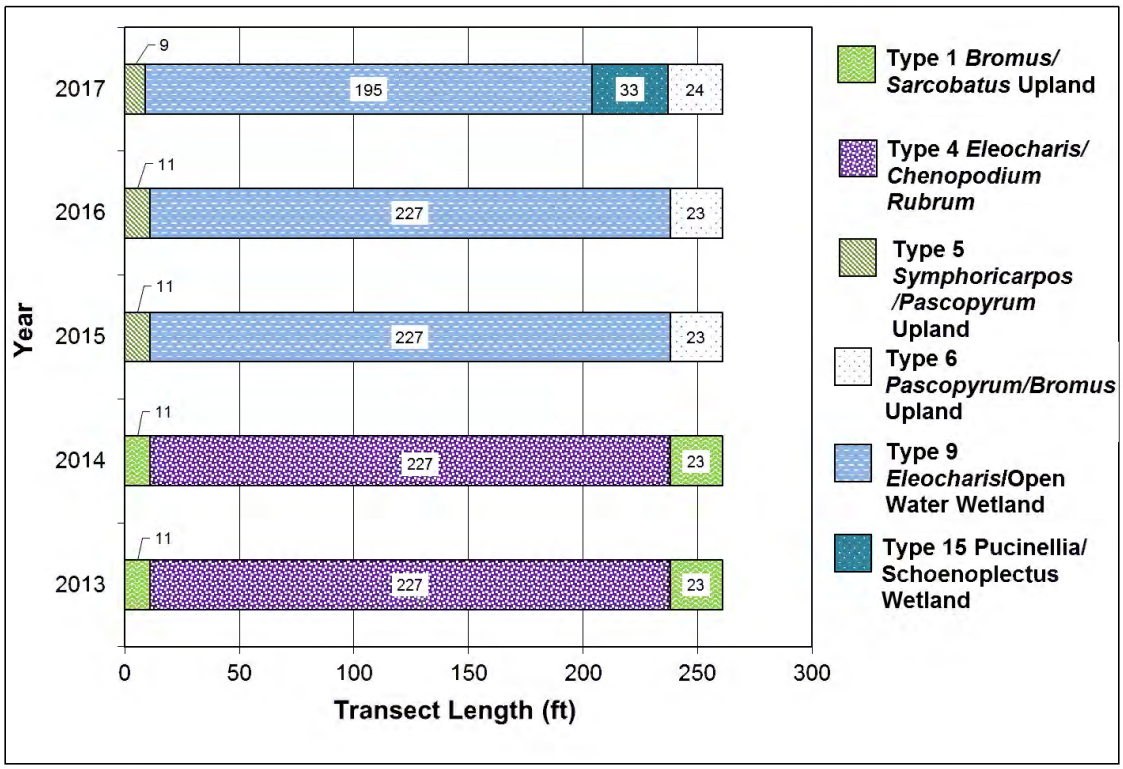


Chart 3-4. Length of Vegetation Communities Within T-2 for the West Site From 2013 Through 2017.

Infestations of two Priority 2B noxious weeds (Canada thistle [*Cirsium arvense*] and leafy spurge [*Euphorbia esula*]) were mapped in several locations within the project site (Figure A-4, Appendix A). Within the project boundary, leafy spurge is the most prevalent noxious weed.

No containerized shrubs or trees were installed at this site. Revegetation efforts included a combination of salvaged wetland materials from impacted wetlands along the road re-construction project, and seeding after construction. The seeding mixture included wand panic grass (*Panicum virgatum*), American mannagrass (*Glyceria grandis*), Baltic rush (*Juncus balticus*), Nebraska sedge (*Carex nebrascensis*), and Nuttall's alkali grass. Woody species are regenerating naturally within the site, including eastern cottonwood (*Populus deltoides*) and fragile willow (*Salix fragilis*). The areas that were recently disturbed by dike repair in 2017 were re-seeded with an upland seed mix.

3.1.3 Soil

The Web Soil Survey for Rosebud County [US Department of Agriculture, 2011] indicates two soil complexes occurring within the project site. These soil complexes are identified as the Borollic Camborthids-Ustic Torrifluvents complex and Marvan soils. The Borollic Camborthids-Ustic Torrifluvents complex is 1 percent hydric and Marvan silty clay is 0 percent hydric [US Department of Agriculture, 2016]. The Marvan Series consist of very deep, well-drained, light (2.5Y 6/2) to dark (2.5Y 4/2) brownish gray clay mapped on alluvial fans, stream terraces, and drainage ways [US Department of Agriculture, 1999].

Soil test pits were excavated at two locations, both within what was originally mapped as the Marvan silty clay soil series (DP-1W and DP-1U; Figure A-3, Appendix A). DP-1W is located on the edge of the wetland depression. The soil profile revealed an olive-brown (2.5Y 4/3) loamy clay from 0 to 8 inches and from a depth of 8–16 inches a mix of very dark grayish brown (2.5Y 3/3) and very dark reddish brown (2.5Y 3/2). Soils in this area along the northeastern edge and adjacent to the road embankment were likely mixed during original wetland construction activities. Because of the dominant wetland vegetation and positive secondary hydrologic indicators, the soil was determined to be hydric. DP-1U is located on a hillside in upland community Type 6 – *Pascopyrum smithii*/*Bromus tectorum*. The soil profile revealed a dark grayish brown and olive-brown (2.5Y 4/2 and 4/3) loamy clay and did not meet the criteria for any hydric soil indicators.

3.1.4 Wetland Delineation

Two data points were used to determine the wetland and upland boundaries in 2017 (Figures A-3 and A-4, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data form (Appendix B). The total acreage of aquatic habitat at the West site in 2017 was 5.89 acres, which was a decrease of 0.12 acre since 2016. The decrease in wetland acreage is likely a result of both drought conditions in the region in 2017 and construction activities that occurred on the site in the spring of 2017. This acreage included approximately 1.29 acres of preexisting wetland and 4.60 acres of created wetland within the excavated areas that have developed wetland characteristics in response to the decreased ground surface elevation. Water levels in the created wetlands support an establishing, emergent plant community; although, open water accounts for a majority of the disturbed area. Hydrophytic plants include common spike-rush,

saltmarsh club-rush, Nuttall's alkali grass, freshwater cordgrass, and foxtail barley. The existing wetlands included the low-lying swales dominated by common spike-rush, broad-leaf cattail, and narrow-leaf cattail. A summary of wetland habitat acreage at the West site is provided in Table 3-4.

Table 3-4. Wetland Habitat Acreages Delineated at the West Site

Wetland and Upland Habitats	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)	2017 (acres)
Existing Wetland	1.29	1.29	1.29	1.29	1.29
Created Wetland	4.15	4.56	4.72	4.72	4.6
Total	5.44	5.85	6.01	6.01	5.89

3.1.5 Wildlife

A list of wildlife species that were observed directly or indirectly during the field surveys from 2013 through 2017 is presented in Table 3-5 and the Wetland Mitigation Site Monitoring form (Appendix B). Wildlife observations were minimal in 2017 because of the extreme heat and low wildlife activity at the time of the monitoring event. No nesting structures have been installed at the site.

Table 3-5. Wildlife Species Observed at the West Site From 2013 Through 2017 (Page 1 of 2)

Common Name	Scientific Name
Bird	
American Avocet	*Recurvirostra americana*
American Goldfinch	*Spinus tristus*
Bald Eagle	*Haliaeetus leucocephalus*
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Belted Kingfisher	*Megaceryle alcyon*
Blue-winged Teal	*Anas discors*
Brown Thrasher	*Toxostoma rufum*
Cedar Waxwing	*Bombycilla cedrorum*
Cliff Swallow	***Petrochelidon pyrrhonota***
Common Nighthawk	*Chordeiles minor*
Eastern Kingbird	*Tyrannus tyrannus*
Golden Eagle	*Aquila chrysaetos*
Grasshopper Sparrow	*Ammodramus savannarum*
Great Blue Heron	*Ardea herodias*
House Wren	***Troglodytes aedon***
Killdeer	*Charadrius vociferus*
Lark Bunting	*Calamospiza melanocorys*
Mallard	*Anas platyrhynchos*
Mourning Dove	*Zenaida macroura*
Northern Harrier	*Circus cyaneus*
Orchard Oriole	*Icterus spurius*
Red-Winged Blackbird	*Agelaius phoeniceus*
Rock Wren	*Salpinctes obsoletus*

Table 3-5. Wildlife Species Observed at the West Site From 2013 Through 2017 (Page 2 of 2)

Common Name	Scientific Name
Bird	
Song Sparrow	*Melospiza melodia*
Swainson's Hawk	*Buteo swainsoni*
Turkey Vulture	*Cathartes aura*
Western Kingbird	***Tyrannus verticalis***
Western Meadowlark	***Sturnella neglecta***
Western Sandpiper	*Calidris mauri*
Wilson's Phalarope	*Phalaropus tricolor*
Yellow Warbler	*Dendroica petechia*
Fish	
Fish sp.	
Mammal	
Coyote	*Canis latrans*
Deer sp.	*Odocoileus* sp.
Meadow Vole	*Microtus pennsylvanicus*
Porcupine	*Erethizon dorsatum*
Raccoon	*Procyon lotor*
White-tailed Deer	*Odocoileus virginianus*
Reptile	
Plains Garter Snake	*Thamnophis radix*

Species that were identified in 2017 are **bolded.**

3.1.6 Functional Assessment

The results of the functional assessments from 2013 through 2017 are summarized in Table 3-6. The completed MWAM form for the West site is included in Appendix B. This site was evaluated as one AA (AA-1) that encompassed 5.89 acres in 2017. The AA was rated as a Category III wetland in 2017 with 64 percent of the total possible points. Ratings for general wildlife habitatand uniqueness decreased slightly from 2016 because of higher disturbance that resulted from dike repair at the site in 2017. The site received a high rating for Montana Natural Heritage Program (MTNHP) species habitat based on the presence of grand redstem (*Ammannia robusta*) within the site, which was observed in 2013 and 2014. The site also received high ratings for short- and long-term surface-water storage, production export/food chain support, and recreation/education potential. The site achieved 41.5 functional units in 2017, which is a slight decrease of 4.5 units since 2016. The new dike constructed before the 2017 survey will have a positive effect on wetland development in future years.

Table 3-6. Montana Wetland Assessment Method Summary for the West Site From 2013 Through 2017

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2013	2014	2015	2016	2017
Listed/Proposed Threatened and Endangered (T&E) Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Mod (0.5)	Mod (0.7)	E (1)	E (1)	Mod (0.7)
General Fish/Aquatic Habitat	N/A	N/A	Mod (0.4)	Mod (0.4)	Low (0.3)
Flood Attenuation	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.6)
Short- and Long-Term Surface-Water Storage	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (0.9)
Sediment/Nutrient/Toxicant Removal	Mod (0.4)	Mod (0.4)	Mod (0.6)	Mod (0.6)	High (1.0)
Sediment/Shoreline Stabilization	Low (0.3)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.6)
Production Export/Food Chain Support	Mod (0.6)	High (0.9)	High (0.9)	High (0.9)	High (0.8)
Groundwater Discharge/Recharge	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	Mod (0.7)
Uniqueness	Mod (0.4)	Mod (0.5)	Mod (0.6)	Mod (0.6)	Mod (0.4)
Recreation/Education Potential (bonus points)	High (0.15)	High (0.15)	High (0.15)	High (0.15)	High (0.15)
Actual Points/Possible Points	**5.45/10**	**6.75/10**	**7.65/11**	**7.65/11**	**7.05/11**
% of Possible Score Achieved	**54.5%**	**67.5%**	**69.6%**	**69.6%**	**64.0%**
Overall Category	**III**	**III**	**II**	**II**	**III**
Total Acreage of Assessed Wetlands Within Site Boundaries	**5.44**	**5.85**	**6.01**	**6.01**	**5.89**
Functional Units (acreage × actual points)	**29.6**	**39.5**	**46.0**	**46.0**	**41.5**

3.1.7 Photographic Documentation

Photographs from Photo-Points 1 through 5 (PP1–PP5) (Figure A-3, Appendix A), the transect start and end points, and wetland determination data points are shown Appendix C.

3.1.8 Maintenance Needs

Infestations of two Priority 2B noxious weeds (Canada thistle and leafy spurge) were mapped in several locations throughout the mitigation site (Figure A-4, Appendix A). Leafy spurge is the most prevalent noxious weed species within the mitigation site and occurs in low to moderate cover classes. MDT has an ongoing weed-control program that assesses and employs weed-control measures within their wetland mitigation sites on a yearly basis. In general, noxious weed cover has decreased because of yearly weed control by MDT.

The dike failure that occurred at the site during high flows in 2013 was repaired by MDT before the 2013 field survey and was intact when inspected in 2013. However, the structure appeared to be inadequately stabilized and susceptible to future failure. An examination of this structure in June 2014 indicated that the structure failed again during high spring flows, which eroded a channel down to the elevation of the original ephemeral thalweg. The dike was not repaired in 2015. MDT worked with the USACE to facilitate a permanent engineered repair for the dike. Because of this coordination, MDT received an NWP #3 permit from the USACE to conduct repairs in the fall/winter of 2016/2017. The dike was reconstructed in the late spring of 2017; photographs of the new

structure are included in Appendix C. Fencing around the perimeter of the monitoring areas was in good condition in 2017.

3.1.9 Current Credit Summary

Approximately 5.89 aquatic habitat acres that consisted of approximately 1.29 acres of preexisting wetland habitat and 4.60 acres of created wetlands were delineated in 2017. Approximately 7.82 acres of upland habitat was mapped on the site in 2017. Table 3-7 presents the calculated credit acres for individual mitigation types with appropriate credit ratios applied using the USACE crediting system. The West site's types and ratios included preservation (4:1), creation (1:1), and upland buffer (5:1). The accrued credit acres at the West site in 2017 totaled 6.48, which is slightly less than accrued acres in 2015 (6.58 acres).

Table 3-7. Credit Summary for the West Site

Wetland	Ratio	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Estimated Credit Acres	2016 Delineated Acres	2016 Estimated Credit Acres	2017 Delineated Acres	2017 Estimated Credit Acres
Preserved Wetland	4:1	1.29	0.32	1.29	0.32	1.29	0.32	1.29	0.32
Created Wetland	1:1	4.56	4.56	4.72	4.72	4.72	4.72	4.60	4.60
Upland Buffer	5:1	7.86	1.57	7.70	1.54	7.70	1.54	7.82	1.56
Total		**13.71**	**6.45**	**13.71**	**6.58**	**13.71**	**6.58**	**13.71**	**6.48**

No quantitative performance measures or success criteria have been established for this wetland mitigation area. Monitoring requirements that are listed within the approved wetland mitigation plan are being satisfied. In general, the areas that were delineated as wetlands met the criteria for hydrophytic vegetation, hydric soil, and wetland hydrology. Noxious weed cover in 2017 was less than 1 percent site wide.

3.2 MIDDLE SITE – SITE 2

3.2.1 Hydrology

The average total annual precipitation recorded at the Forsyth, Montana, weather station (243098) from 1975 to through 2016 was 14.6 inches [Western Regional Climate Center, 2017]. The precipitation between January and August of 2016 totaled 16.77 inches, which is well above the long-term average of 12.03 inches. In 2017, precipitation between January and August totaled only 7.59 inches which is the fifth driest year since 1975 and nearly 4.5 inches below the long-term average. In coordination with the Montana Governor's Drought and Water Supply Advisory Committee, the Montana State Library publishes monthly maps of moisture by county. The July 2017 map shows Rosebud County to be severely dry. Additionally, the governor of Montana issued Executive Order 5-2017 on June 23, 2017, declaring a drought emergency to exist in eastern Montana. Later, under Executive Order No. 6-2017, the governor declared a drought disaster in Rosebud County and 13 other counties in Eastern Montana [DNRC, 2017].

This site is situated near abandoned meander bends associated with Big Porcupine Creek that exhibit wetland characteristics. The site may experience occasional flooding during high flows in Big Porcupine Creek but is not intended to exhibit perennial hydrology because of its proximity to Montana Highway 12. The excavated depression exhibited signs of inundation that persisted for an extended period before the field survey. Positive hydrologic indicators that were observed at this site included surface soil cracks, and geomorphic position. The site was not inundated at the time of the 2017 field survey.

Two data points (DP-1W and DP-1U) were assessed to determine the upland and wetland boundaries (Wetland Determination Data forms, Appendix B). DP-1W is located in an area of the excavated depression that met the wetland criteria. Hydrologic indicators at the data point included surface soil cracks, and geomorphic position. DP-1U did not meet the wetland hydrology criteria.

3.2.2 Vegetation

A comprehensive list of the 57 species identified on site from 2013 through 2017 is presented in Table 3-8. Only one new species, fragile willow (Salix fragilis), was identified at this site in 2017. The indicator status for all of the plants was derived from the 2016 NWPL [Lichvar et al., 2016]. Upland community Type 1 – *Pascopyrum smithii/Helianthus annuus* and wetland community Type 2 – *Rumex crispus/Eleocharis palustris* were identified in 2013 and 2014 and transitioned into upland community Type 3 – *Pascopyrum smithii/Elymus canadensis* and wetland community Type 4 – *Puccinellia nuttalliana/Hordeum jubatum*, respectively, in 2015 and persisted in 2017. The vegetation community boundaries are shown on Figure A-6 (Appendix A). The species composition for each community is discussed below and included on the Middle site's Wetland Mitigation Site Monitoring form (Appendix B).

Upland Type 3 – *Pascopyrum smithii/Elymus canadensis* (western wheatgrass/nodding wild rye) is located in upland that surrounds the excavated depression, adjacent to Montana Highway 12, and within the monitoring boundary. This community replaced upland community Type 1 – *Pascopyrum smithii/Helianthus annuus* because of a shift in species composition and their associated cover classes. The community was dominated by western wheatgrass and eastern cottonwood (*Populus deltoids*) saplings, yellow sweet clover (*Melilotus officinalis*), Japanese brome (*Bromus arvensis*), and eastern cottonwood.

Wetland Type 4 – *Puccinellia nuttaliana/Hordeum jubatum* (Nutall's alkali grass/foxtail barley) was identified within the excavated depression. This community replaced wetland community Type 2 – *Rumex crispus/Eleocharis palustris* because of a shift in species composition and their associated cover classes. Common species included Nuttall's alkali grass, foxtail barley, common spike-rush (*Eleocharis palustris*), western wheatgrass, meadow false rye grass *(Schedonorus pratensis*), and curly dock (*Rumex crispus*). Several of these species are classified as upland and appear to be increasing in coverage likely because of drought conditions in the region.

Table 3-8. Vegetation Species Observed at the Middle Site From 2013 Through 2017 (Page 1 of 2)

Scientific Names	Common Names	GP Indicator Status[a]
Alisma triviale	Northern Water-Plantain	OBL
Alopecurus pratensis	Field Meadow-Foxtail	FACW
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Avena fatua	Wild Oats	NL
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	California Brome	NL
Bromus arvensis	Japanese Brome	NL
Bromus tectorum	Cheatgrass	NL
Chenopodium album	Lamb's Quarters	FACU
Cirsium arvense	Canada Thistle	FACU
Convolvulus arvensis	Field Bindweed	NL
Deschampsia caespitosa	Tufted Hair Grass	FACW
Deschampsia elongata	Slender Hair Grass	FAC
Echinochloa crus-galli	Large Barnyard Grass	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elymus canadensis	Nodding Wild Rye	FACU
Elymus lanceolatus	Streamside Wild Rye	FACU
Elymus repens	Creeping Wild Rye	FACU
Elymus trachycaulus	Slender Wild Rye	FACU
Euphorbia esula	Leafy Spurge	NL
Glyceria grandis	American Mannagrass	OBL
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Foxtail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	Prairie Flax	NL
Logfia arvensis	Field Cottonrose	NL
Melilotus officinalis	Yellow Sweet Clover	FACU
Muhlenbergia asperifolia	Alkali Muhly	FAC
Panicum capillare	Common Panic Grass	FAC
Pascopyrum smithii	Western Wheatgrass	FACU
Poa compressa	Flat-Stem Bluegrass	FACU
Poa palustris	Fowl Bluegrass	FACW
Polygonum aviculare	Yard Knotweed	FACU
Populus deltoides	Eastern Cottonwood	FAC
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Ratibida columnifera	Prairie Coneflower	NL
Rosa arkansana	Prairie Rose	FACU
Rumex acetosella	Common Sheep Sorrel	FAC

Table 3-8. Vegetation Species Observed at the Middle Site From 2013 Through 2017 (Page 2 of 2)

Scientific Names	Common Names	GP Indicator Status[(a)]
Rumex crispus	Curly Dock	FAC
Salix exigua	Narrow-Leaf Willow	FACW
Salix fragilis	**Fragile Willow**	**FAC**
Sarcobatus vermiculatus	Greasewood	FAC
Schedonorus pratensis	Meadow False Rye Grass	FACU
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Setaria pumila	Yellow Bristle Grass	FACU
Solanum rostratum	Buffalo Bur	NL
Symphoricarpos albus	Common Snowberry	UPL
Tamarix chinensis	Salt-cedar	NL
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-beard	NL
Typha latifolia	Broad-Leaf Cattail	OBL
Xanthium strumarium	Rough Cockleburr	FAC

(a) 2016 NWPL [Lichvar et al., 2016]
New species identified in 2017 are **bolded**.

One vegetation transect, T-1, was established at the site that runs perpendicular to the linear excavated wetland (Figure A-6, Appendix A). Thirty-eight percent of the transect was located in wetland habitat. Approximately 17 percent of the transect is unvegetated bare ground. In 4 years, the site has increased in total vegetation cover. However, Table 3-9 indicates that the length of hydrophytic communities has decreased, which is likely a function of a decrease in shallow inundation width since 2014. Vegetation transect results are detailed on the Middle site's Wetland Mitigation Site Monitoring form in Appendix B and are summarized in Table 3-9 and Charts 3-5 and 3-6. Photographs of the transect start and end points are provided in Appendix C.

Table 3-9. T-1 Data Summary for the Middle Site From 2013 Through 2017

Monitoring Year	2013	2014	2015	2016	2017
Transect Length (feet)	**50**	**50**	**50**	**50**	**50**
Vegetation Community Transitions Along Transect	2	2	2	2	2
Vegetation Communities Along Transect	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	1
Total Vegetative Species	16	20	21	11	17
Total Hydrophytic Species	6	8	7	3	4
Total Upland Species	10	12	14	8	13
Estimated % Total Vegetative Cover	40	50	90	85	83
Estimated % Unvegetated	60	50	10	15	17
% Transect Length Comprising Hydrophytic Vegetation Communities	52	52	30	30	38
% Transect Length Comprising Upland Vegetation Communities	48	48	70	70	62
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0

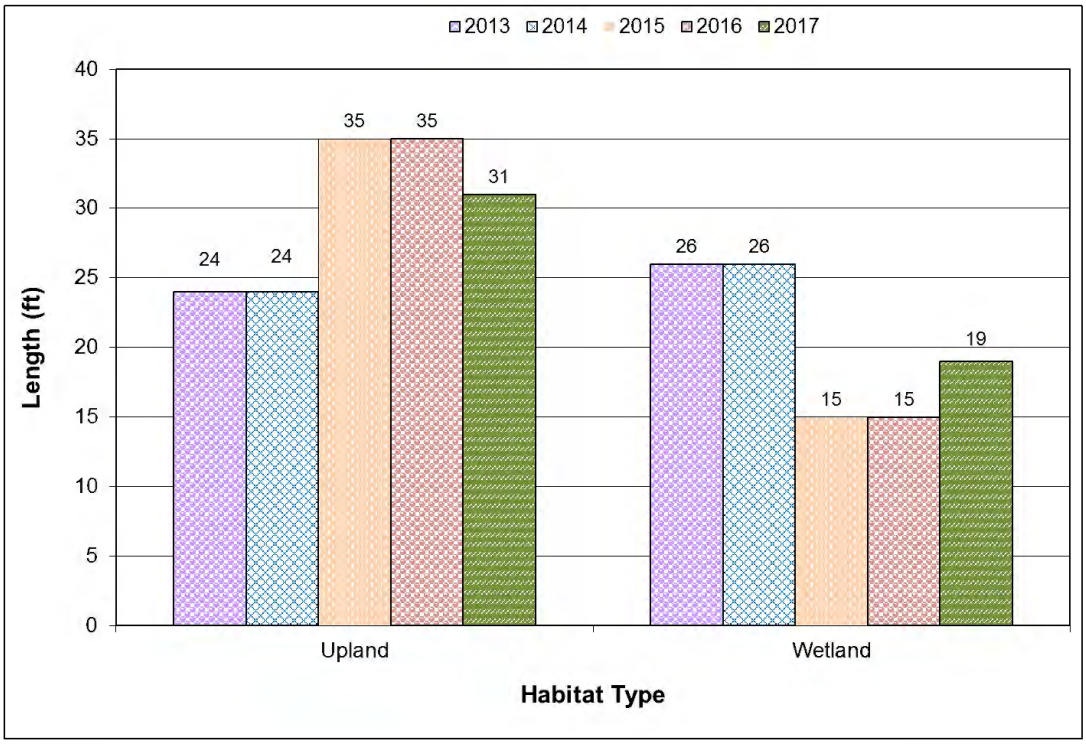


Chart 3-5. T-1 Map for the Middle Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (50 Feet) From 2013 Through 2017.

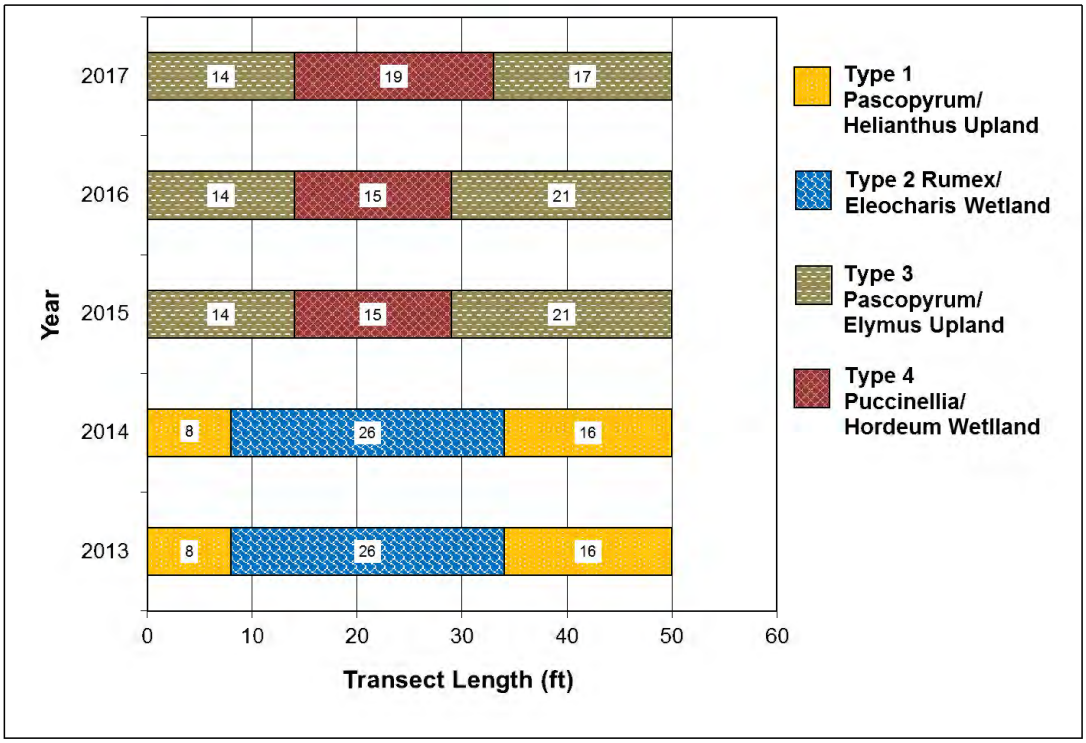


Chart 3-6. Length of Vegetation Communities Within T-1 at the Middle Site From 2013 Through 2017.

Infestations of four Priority 2B noxious weeds were identified at the site: field bindweed, salt-cedar, leafy spurge, and Canada thistle (Figure A-6, Appendix A). No woody vegetation was installed within the site. Revegetation efforts at the site included seeding a mixture of wand panic grass, American mannagrass, Baltic rush, Nebraska sedge, and Nuttall's alkali grass after construction disturbance. Cottonwood seedlings have been observed along the margin of the wetland at the apparent edge of early-season inundation every year since 2013.

3.2.3 Soil

The Web Soil Survey for Rosebud County [US Department of Agriculture, 2011] indicates only one mapped soil for the project area, Harlem silty clay (0–2 percent slopes). These very deep, well-drained soils are seen on floodplains and are occasionally flooded.

Soil test pits were examined at two locations, both within what was originally mapped as the Harlem silty clay soil series (DP-1W and DP-1U; Figure A-5, Appendix A). DP-1W is located in an excavated depression near the center of the site, in an area that met the hydric soil criteria. The soil profile revealed a dark olive-brown (2.5Y 3/3) loamy clay. Given the dominant hydrophytic community and positive hydrology at the data point, the soils were determined to be hydric. DP-1U is located in upland community Type 3 – *Pascopyrum smithii/Elymus canadensis*, approximately 10 feet northeast of DP-1W. The soil profile revealed a dark olive-brown (2.5Y 4/3) loamy clay and did not meet the criteria for any hydric soil indicators.

3.2.4 Wetland Delineation

Two data points were used to determine the upland and wetland boundaries in 2017 (Figures A-5 and A-6, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data forms (Appendix B). The total acreage of aquatic habitat at the Middle site in 2017 was 0.58 acre within the 1.8-acre project area, as shown in Table 3-10. The floor of the excavated depression was identified as wetland based on the presence of positive wetland hydrology indicators, hydric soil, and the predominance of hydrophytic species. The wetland boundary may extend slightly up the side slopes of the excavated basin in subsequent growing seasons if hydrology increases over time based on the hydrological indicators (seasonal inundation) that were observed during the field surveys in previous years.

Table 3-10. Wetland and Upland Habitat Acreages Delineated at the Middle Site From 2013 Through 2017

Wetland and Upland Habitats	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)	2017 (acres)
Project Area	1.80	1.80	1.80	1.80	1.80
Created Wetland	0.49	0.49	0.49	0.49	0.58
Upland Buffer	1.31	1.31	1.31	1.31	1.22

3.2.5 Wildlife

A list of wildlife species observed directly and indirectly during the field surveys from 2013 through 2017 is shown in Table 3-11 and in the Wetland Mitigation Site Monitoring form

(Appendix B). Because of high temperatures and mid-afternoon conditions, no wildlife were observed within the mitigation site in 2017.

Table 3-11. Wildlife Species Observed at the Middle Site From 2013 Through 2017

Common Name	Scientific Name
Amphibians	
Frog sp.	
Birds	
American Goldfinch	*Spinus tristus*
Common Nighthawk	*Chordeiles minor*
Eastern Bluebird	*Sialia sialis*
Eastern Kingbird	*Tyrannus tyrannus*
Killdeer	*Charadrius vociferus*
Mourning Dove	*Zenaida macroura*
Turkey Vulture	*Cathartes aura*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
Mammals	
Coyote	*Canis latrans*
Deer sp.	*Odocoileus* sp.
Raccoon	*Procyon lotor*
Reptiles	
Plains Garter Snake	*Thamnophis radix*

3.2.6 Functional Assessment

The results of the functional assessments from 2013 through 2017 are summarized in Table 3-12. The Middle site's MWAM form is provided in Appendix B. The Middle site was evaluated as one AA and encompassed 0.58 acre. The prominent factor that adversely impacted the overall score and functional units at the site in 2013 was the general condition of the AA: a high percentage of bare ground, low vegetation cover, and low quality of wildlife habitat. The disturbance rating went from high in 2013 to moderate in 2014 based on the increased vegetation cover in disturbed areas. The Montana-listed S2 species of concern, grand redstem (*Ammannia robusta*), was documented growing within the constructed wetland in 2013 and provided a high MTNHP rating. The flood attenuation rating was modified based on the lack of connection to Big Porcupine Creek. The sediment/shoreline stabilization increased in 2015 to reflect the increase in percent cover of wetland species with stability ratings greater than or equal to 6. Ratings for general wildlife habitat, sediment/ nutrient/toxicant removal, and uniqueness increased from 2013 to 2016 because of less disturbance and higher wetland vegetation cover; no change was observed from 2016 to 2017. This site achieved 42.2 percent of the possible score and a total of 2.0 functional units in 2017, which is an increase of 0.1 unit since 2016 because of the increase in wetland acreage. Continual development of the vegetation cover will result in increased functional units, although the small size of the AA will limit the total score.

Table 3-12. Montana Wetland Assessment Method Summary for the Middle Site From 2013 Through 2017

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2013	2014	2015	2016	2017
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Low (0.2)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	High (1.0)	N/A	N/A	N/A	N/A
Short- and Long-Term Surface-Water Storage	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	Mod (0.7)	High (0.8)	High (0.8)	High (0.8)
Sediment/Shoreline Stabilization	Low (0.2)	Low (0.2)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Production Export/Food Chain Support	Low (0.2)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
Groundwater Discharge/Recharge	N/A	/N/A	N/A	N/A	N/A
Uniqueness	Low (0.1)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
Recreation/Education Potential (bonus points)	N/A	N/A	N/A	N/A	N/A
Actual Points/Possible Points	**3.9/9**	**3.3/9**	**3.8/9**	**3.8/9**	**3.8/9**
% of Possible Score Achieved	**43.3%**	**36.7%**	**42.2%**	**42.2%**	**42.2%**
Overall Category	**III**	**III**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands Within Site Boundaries	**0.49**	**0.49**	**0.49**	**0.49**	**0.58**
Functional Units (acreage × actual points)	**1.9**	**1.6**	**1.9**	**1.9**	**2.0**

3.2.7 Photographic Documentation

Photographs from Photo-Points 1 and 2 (PP1 and PP2) (Figure A-5, Appendix A), the transect start and end points, and wetland determination data points are provided in Appendix C.

3.2.8 Maintenance Needs

Four minor infestations of Canada thistle, which is a Priority 2B noxious weed, were identified at this site in 2017 (Figure A-6, Appendix A) and should be controlled to prevent further spread and colonization. All infestations have a low cover class (1–5 percent). Fencing along the mitigation area was in good condition. No man-made water-control structures or bird boxes have been installed at this site.

3.2.9 Current Credit Summary

Table 3-13 shows the total delineated acres and credit acres estimated for the Middle site from 2014 through 2017. The 2017 wetland delineation was 0.58 acre, an increase of 0.09 acre since 2016. Upland buffer decreased to 1.22 acre. The site accrued 0.82 estimated credit acre in 2017. No performance standards were identified for this site. One noxious weed was identified within the mitigation site boundaries but exhibited very low percent areal cover (1–5 percent). The percent cover of native hydrophytes was low. The cover of wetland vegetation will increase if favorable hydrologic conditions persist.

Table 3-13. Credit Summary for the Middle Site

Habitat Type	Mitigation Ratio	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Estimated Credit Acres	2016 Delineated Acres	2016 Estimated Credit Acres	2017 Delineated Acres	2017 Estimated Credit Acres
Created Wetland	1:1	0.49	0.49	0.49	0.49	0.49	0.49	0.58	0.58
Upland Buffer	5:1	1.31	0.26	1.31	0.26	1.31	0.26	1.22	0.24
Total		**1.80**	**0.75**	**1.80**	**0.75**	**1.80**	**0.75**	**1.8**	**0.82**

3.3 EAST SITE – SITE 3

3.3.1 Hydrology

The average total annual precipitation recorded at the Forsyth, Montana, weather station (243098) from 1975 to through 2016 was 14.6 inches [Western Regional Climate Center, 2017]. The precipitation between January and August of 2016 totaled 16.77 inches, which is well above the long-term average of 12.03 inches. In 2017, precipitation between January and August totaled only 7.59 inches which is the fifth driest year since 1975 and nearly 4.5 inches below the long-term average. In coordination with the Montana Governor's Drought and Water Supply Advisory Committee, the Montana State Library publishes monthly maps of moisture by county. The July 2017 map shows Rosebud County to be Severely Dry. Additionally, the governor of Montana issued Executive Order 5-2017 on June 23, 2017, declaring a drought emergency to exist in eastern Montana. Later, under Executive Order No. 6-2017, the governor declared a drought disaster in Rosebud County and 13 other counties in Eastern Montana [DNRC, 2017].

The East site is very similar to the Middle site. The main sources of hydrology at the East site are shallow groundwater, direct precipitation, and surface runoff from adjacent uplands. Old meander scars of Big Porcupine Creek with relic and contemporary wetland characteristics are located directly adjacent to the site. Positive hydrologic indicators that were observed at this site included surface soil cracks and geomorphic position

Three data points (DP-1W, DP-1U, and DP-2U) were assessed to determine the upland and wetland boundaries (Wetland Determination Data forms, Appendix B). DP-1W is located in the northwest end of the site in an area that met the wetland criteria. Positive indicators of wetland hydrology at this data point included a FAC test, soil cracks, and geomorphic position. No signs of wetland hydrology were observed at DP-1U, which is located upslope of the wetland boundary. Only the secondary indicator geomorphic positon was observed at DP-2U, which is located in the central area of excavated wetland depression. In general, the central area appears to be higher than the northwestern and southeastern ends of the excavated depression. Therefore, the central reach of the depression may have insufficient primary hydrologic indicators to support the development of a dominant hydrophytic vegetation community.

3.3.2 Vegetation

A comprehensive list of 58 species compiled during the field surveys from 2013 through 2017 is presented in Table 3-14. Three new plant species were observed in 2017, including two wetland species (fragile willow [*Salix fragilis*] and alkali muhly [*Muhlenbergia asperifolia*]), and one upland

species (flatstem bluegrass [*Poa compressa*]). The indicator status for all of the plants was derived from the 2016 NWPL [Lichvar et al., 2016]. Two community types were identified and mapped at this site in 2017 (Figure A-8, Appendix A) and included upland Type 3 – *Pascopyrum smithii/Elymus* spp. and wetland Type 4 – *Hordeum jubatum/Eleocharis palustris*. The species composition for each community is included on the East site's Wetland Mitigation Site Monitoring form (Appendix B) and discussed in this section.

Table 3-14. Vegetation Species Observed at the East Site From 2013 Through 2017 (Page 1 of 2)

Scientific Names	Common Names	GP Indicator Status[(a)]
Agropyron cristatum	Crested Wheatgrass	NL
Algae, green	Algae, green	NL
Alisma triviale	Northern Water-Plantain	OBL
Alopecurus arundinaceus	Creeping Meadow-Foxtail	FACW
Alopecurus pratensis	Field Meadow-Foxtail	FACW
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Artemisia frigida	Fringed Sage	NL
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	California Brome	NL
Bromus inermis	Smooth Brome	UPL
Bromus arvensis	Japanese Brome	NL
Bromus tectorum	Cheatgrass	NL
Chenopodium album	Lamb's Quarters	FACU
Convolvulus arvensis	Field Bindweed	NL
Descurainia sophia	Herb Sophia	NL
Echinochloa crus-galli	Large Barnyard Grass	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elymus canadensis	Nodding Wild Rye	FACU
Elymus repens	Creeping Wild Rye	FACU
Elymus trachycaulus	Slender Wild Rye	FACU
Elymus sp.	Wild Rye	NL
Filago arvensis	Field Fluffweed	NL
Glyceria elata	Tall Mannagrass	OBL
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hesperostipa comata	Needle-and-Thread	NL
Hordeum jubatum	Foxtail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	Prairie Flax	NL
Medicago sativa	Alfalfa	UPL

Table 3-14. Vegetation Species Observed at the East Site From 2013 Through 2017 (Page 2 of 2)

Scientific Names	Common Names	GP Indicator Status[(a)]
Melilotus officinalis	Yellow Sweet Clover	FACU
Muhlenbergia asperifolia	**Alkali Muhly**	**FACW**
Pascopyrum smithii	Western Wheatgrass	FACU
Poa compressa	**Flat-stem Bluegrass**	**FACU**
Poa pratensis	Kentucky Bluegrass	FACU
Polygonum aviculare	Yard Knotweed	FACU
Populus deltoides	Eastern Cottonwood	FAC
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Ratibida columnifera	Prairie Coneflower	NL
Rumex acetosella	Common Sheep Sorrel	FAC
Rumex crispus	Curly Dock	FAC
Sagittaria cuneata	Arum-Leaf Arrowhead	OBL
Salix exigua	Narrow-Leaf Willow	FACW
Salix fragilis	**Fragile Willow**	**FAC**
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Solanum rostratum	Buffalo Bur	NL
Tamarix chinensis	Salt-Cedar	NL
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-Beard	NL
Typha angustifolia	Narrow-Leaf Cattail	OBL
Typha latifolia	Broad-Leaf Cattail	OBL
Veronica sp.	Speedwell	NL

(a) 2016 NWPL [Lichvar et al., 2016].
New species that were identified in 2017 are **bolded.**

Upland community Type 3 represented the upland areas that surround the excavated wetland, as well as a newly observed upland area in the center of the excavated depression. Dominant species included western wheatgrass, nodding wild rye (*Elymus canadensis*), and slender wild rye.

Wetland Type 4 – *Hordeum jubatum/Eleocharis palustris* is located within the excavated depression in the eastern and western portions of the site. The community was dominated by foxtail barley, common spike-rush, and western wheatgrass. Other species observed included saltmarsh club-rush, field meadow-foxtail, and Kentucky bluegrass (*Poa pratensis*). Seedlings of various willows (*Salix exigua* and *S. fragilis*) and cottonwood persisted in this community in 2017.

Vegetation cover was measured along two transects: one on each end of the East site (Figure A-7, Appendix A). Data recorded for T-1 are summarized in Table 3-15 and Charts 3-7 and 3-8. The East site's Wetland Mitigation Site Monitoring form (Appendix B) also displays this site's data.

Photographs of the transect start and end points are provided in Appendix C. T-1 is located at the northwestern end of the site and extends 125 feet. This transect begins at the fenced boundary in upland community Type 3 – *Pascopyrum smithii/Elymus* spp., crosses wetland community Type 2 – *Horeum jubatum/Eleocharis palustris*, and terminates in upland community Type 3. Upland habitat along the edge of the constructed wetland has transitioned to a climax community. Wetland habitat along this transect is not expected to increase considerably because of the distinct topographic break that defines the wetland boundary.

Table 3-15. T-1 Data Summary for the East Site From 2013 Through 2017

Monitoring Year	2013	2014	2015	2016	2017
Transect Length (feet)	**125**	**125**	**125**	**125**	**125**
Vegetation Community Transitions Along Transect	2	2	2	2	2
Vegetation Communities Along Transect	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	1
Total Vegetative Species	16	24	26	22	17
Total Hydrophytic Species	5	7	8	9	7
Total Upland Species	11	17	18	11	10
Estimated % Total Vegetative Cover	40	40	90	90	95
Estimated % Unvegetated	60	60	10	10	5
% Transect Length Comprising Hydrophytic Vegetation Communities	51.2	52	50	50	50
% Transect Length Comprising Upland Vegetation Communities	48.8	48	50	50	50
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0

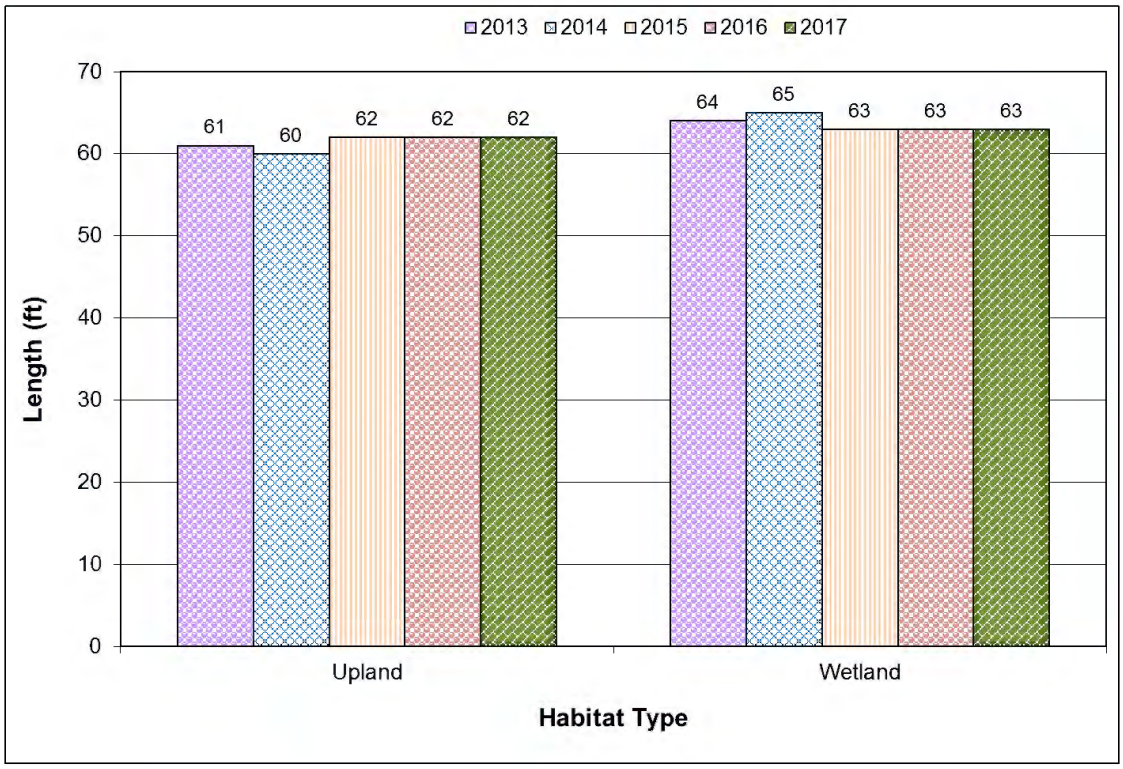


Chart 3-7. T-1 Map for the East Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (125 Feet) From 2013 Through 2017.

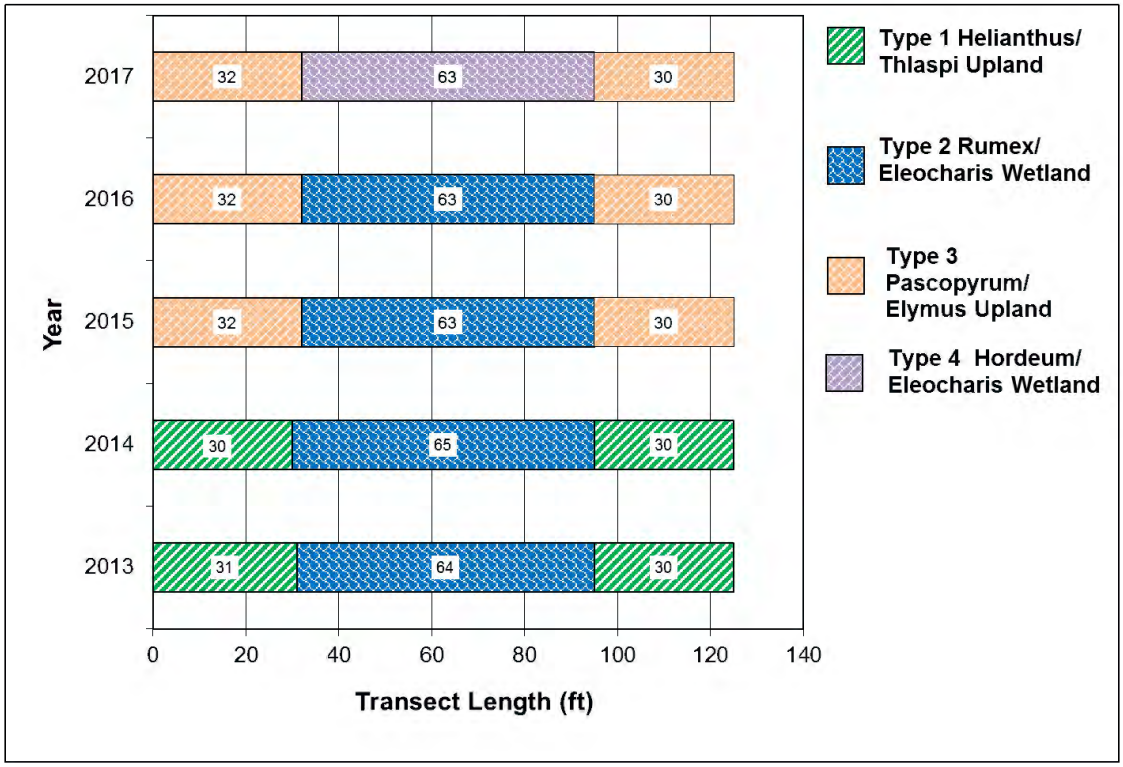


Chart 3-8. Length of Vegetation Communities Within T-1 at the East Site From 2013 Through 2017.

T-2 is very similar to T-1 and is located at the southeastern end of the site. This transect begins at the fenced boundary in upland community Type 3 – *Pascopyrum smithii/Elymus* spp., crosses wetland community Type 4 – *Horeum jubatum/Eleocharis palustris*, and terminates in upland community Type 3. T-2 data are summarized in Table 3-16 and Charts 3-9 and 3-10.

Table 3-16. T-2 Data Summary for the East Site From 2013 Through 2017

Monitoring Year	2013	2014	2015	2016	2017
Transect Length (feet)	**181**	**181**	**181**	**181**	**181**
Vegetation Community Transitions Along Transect	2	2	2	2	2
Vegetation Communities Along Transect	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	1
Total Vegetative Species	12	24	26	26	11
Total Hydrophytic Species	5	9	8	6	4
Total Upland Species	7	15	18	20	7
Estimated % Total Vegetative Cover	40	55	90	94	98
Estimated % Unvegetated	60	45	10	6	2
% Transect Length Comprising Hydrophytic Vegetation Communities	63	63	44	44	55
% Transect Length Comprising Upland Vegetation Communities	37	37	56	56	45
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0

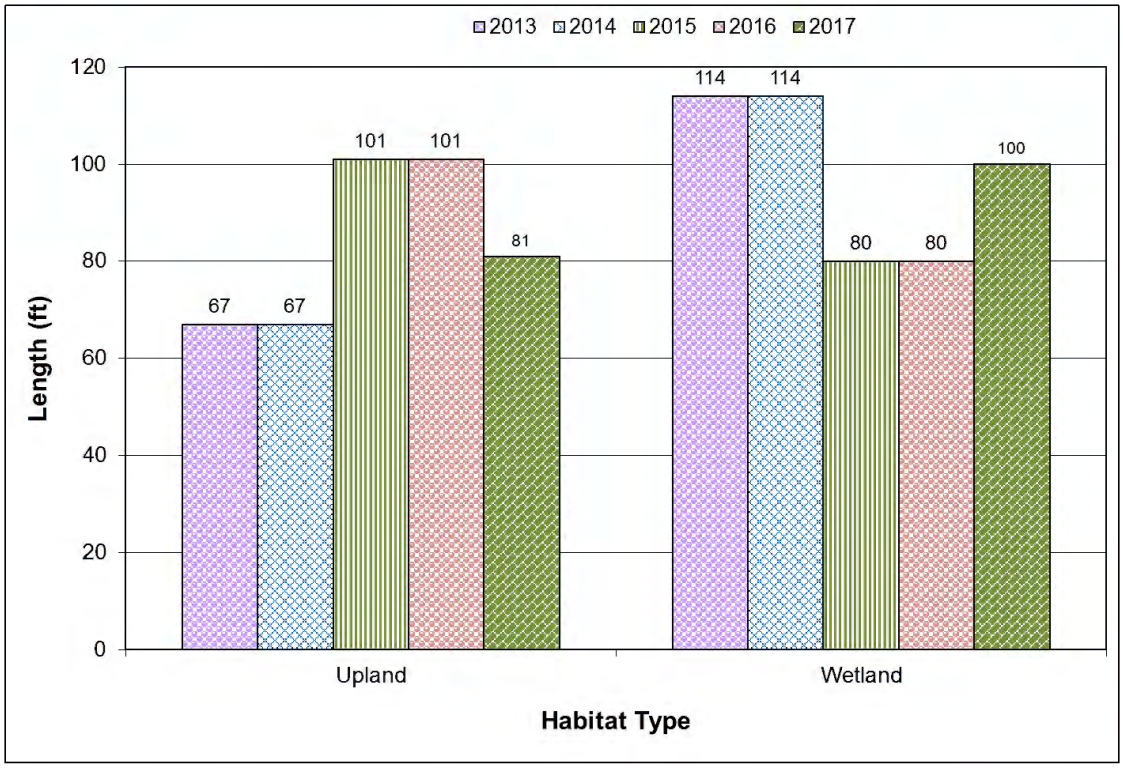


Chart 3-9. T-2 Map for the East Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (181 Feet) From 2013 Through 2017.

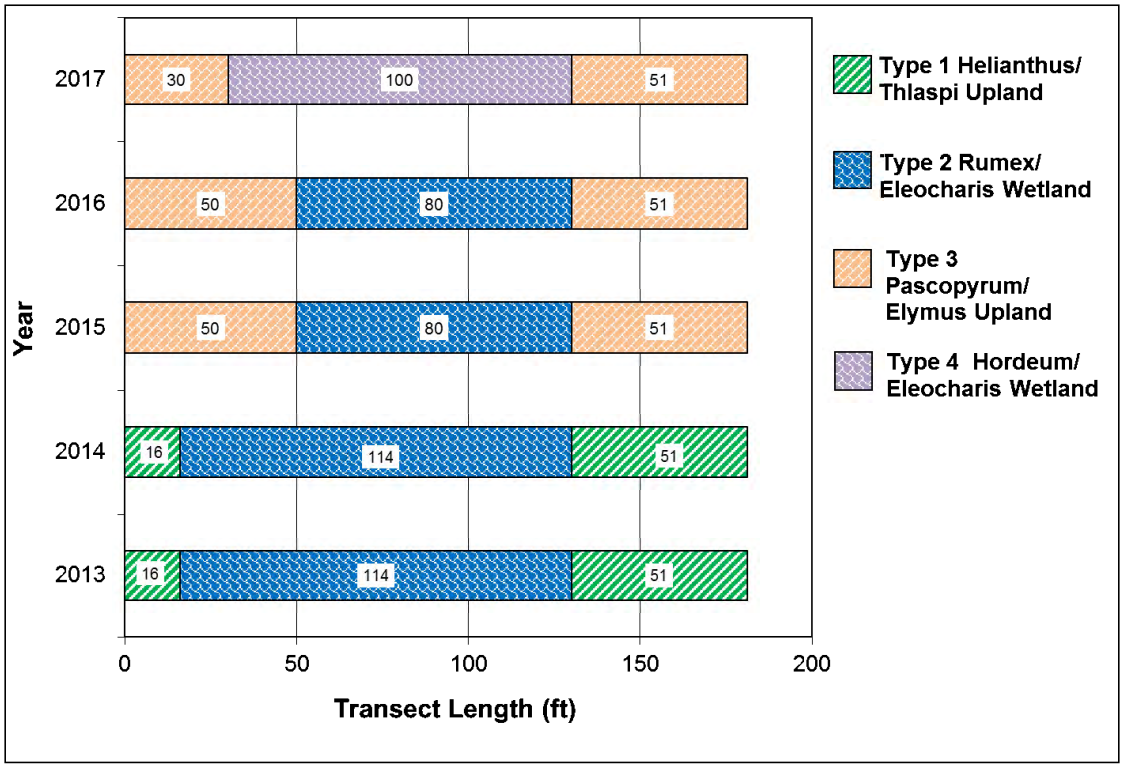


Chart 3-10. Length of Vegetation Communities Within T-2 at the East Site From 2013 Through 2017.

Infestations of one Priority 2B noxious weed (salt-cedar) were mapped in two locations, as shown on Figure A-8 (Appendix A). No woody plants were installed at the East site. Mature cottonwoods and willows in the area appear to be providing natural regeneration of cottonwoods and willows; seedlings of both genera were documented within the wetland community.

3.3.3 Soil

The Web Soil Survey for Rosebud County [US Department of Agriculture, 2011] indicates only one mapped soil for the project area: Harlem silty clay (0– 2 percent slopes). These very deep, well-drained soils are seen on floodplains and are occasionally flooded. This map unit series is identified on the *Montana Hydric Soil List* [NRCS, 2014].

Soil test pits were examined at three locations, all within what was originally mapped as the Harlem silty clay soil series (DP-1W, DP-1U, and DP-2U; Figure A-7, Appendix A). DP-1W is located in the western edge of the wetland depression within an area that met the wetland criteria. The soil profile revealed a dark grayish brown (2.5Y 3/2), silty clay with very dark grayish brown (2.5 Y 4/4), redoximorphic concentrations along pore linings. The soil met the criteria for redox dark surface (F6) and classification as a hydric soil. DP-1U is located approximately 10 feet northwest of DP-1W on the side slope of the excavated basin in the adjacent uplands. The soil profile revealed a dark olive-brown (2.5Y 3/3), silty clay and did not meet the criteria for any hydric soil indicators. DP-2U is located in the central reach of the excavated depression. The soil profile revealed a very dark grayish brown (2.5Y 3/2) silty clay and did not meet the criteria for any hydric soil indicators.

3.3.4 Wetland Delineation

Three data points were evaluated in 2016 to determine the wetland and upland boundaries at the site (Figures A-7 and A-8, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data forms (Appendix B). The total acreage of aquatic habitat at the East site in 2017 was 0.43 acre, which indicates that this area has remained stable since 2016, as shown in Table 3-17. Ground surface elevation may be contributing to the development of an upland community within the central area of the excavation, which appears to be slightly higher than the surrounding ground.

Table 3-17. Wetland/Upland Habitat Acreages Delineated at the East Site From 2013 Through 2017

Wetland and Upland Habitats	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)	2017 (acres)
Project Area	2.74	2.74	2.74	2.74	2.74
Created Wetland	1.19	1.19	0.46	0.43	0.43
Upland Buffer	1.55	1.55	2.28	2.31	2.31

3.3.5 Wildlife

A list of wildlife species observed directly and indirectly at the site during the field survey from 2013 through 2017 is presented in Table 3-18 and the Wetland Mitigation Site Monitoring form (Appendix B). No new species were observed at the site because of the mid-afternoon survey time and high mid-summer temperatures.

Table 3-18. Wildlife Species Observed at the East Site From 2013 Through 2017 (Page 1 of 2)

Common Name	Scientific Name
Amphibian	
Northern Leopard Frog	*Rana pipiens*
Bird	
American Goldfinch	*Spinus tristus*
American Robin	*Turdus migratorius*
Bald Eagle	*Haliaeetus leucocephalus*
Bank Swallow	*Riparia*
Barn Swallow	*Hirundo rustica*
Cliff Swallow	*Petrochelidon pyrrhonota*
Common Grackle	*Quiscalus quiscula*
Common Nighthawk	*Chordeiles minor*
Eastern Kingbird	*Tyrannus tyrannus*
Field Sparrow	*Spizella pusilla*
Killdeer	*Charadrius vociferus*
Lark Sparrow	*Chondestes grammacus*
Mourning Dove	*Zenaida macroura*

Table 3-18. Wildlife Species Observed at the East Site From 2013 Through 2017 (Page 2 of 2)

Common Name	Scientific Name
Bird	
Red-Winged Blackbird	*Agelaius phoeniceus*
Turkey Vulture	*Cathartes aura*
Vesper Sparrow	*Pooecetes gramineus*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
Western Sandpiper	*Calidris mauri*
Mammal	
Coyote	*Canis latrans*
Deer sp.	***Odocoileus* sp.**
Raccoon	*Procyon lotor*
Reptile	
Western Hog-nosed Snake	*Heterodon nasicus*

Species that were identified in 2017 are **bolded**.

3.3.6 Functional Assessment

The results of the functional assessments from 2013 through 2017 are summarized in Table 3-19. The completed East site's MWAM form is included in Appendix B. The total aquatic habitat developed to date within the 2.74-acre project area is 0.43 acre. The site was evaluated as one AA and rated as a Category III wetland with 48.9 percent of the total possible points. The Montana-listed S2 species of concern (grand redstem and western hog-nosed snake) were documented in 2013 and 2015, respectively, and provided a high MTNHP species habitat rating. The disturbance rating improved from high in 2013 to moderate from 2014 through 2017. Sediment/shoreline stabilization improved from a low to moderate rating from 2015 to 2016 because of an increase in percent cover of wetland species with stability ratings greater than or equal to 6. Short- and long-term surface-water storage was given a low rating in 2015 because of the decrease in water contained in the AA's wetlands that are subject to periodic flooding/ponding. The site achieved 1.89 functional units, which was a decrease of 3.2 units since 2014. The decrease in functional units was primarily related to the wetland acreage contraction, which is influenced by the well-below-average precipitation received at the site during 2015 and low precipitation in 2017 through the summer growing season, as well as higher elevation within the central zone of the excavated area.

Table 3-19. Montana Wetland Assessment Method Summary for the East Site From 2013 Through 2017

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2013	2014	2015	2016	2017
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Low (0.2)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	N/A	N/A	N/A	N/A	N/A
Short- and Long-Term Surface-Water Storage	Mod (0.6)	Mod (0.6)	Low (0.3)	Low (0.3)	Low (0.3)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Low (0.2)	Low (0.2)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Production Export/Food Chain Support	Low (0.2)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)
Groundwater Discharge/Recharge	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.1)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
Recreation/Education Potential (bonus points)	N/A	N/A	N/A	N/A	N/A
Actual Points/Possible Points	**3.6/9**	**4.3/9**	**4.4/9**	**4.4/9**	**4.4/9**
% of Possible Score Achieved	**40.0%**	**47.8%**	**48.9%**	**48.9%**	**48.9%**
Overall Category	**III**	**III**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands Within Site Boundaries	**1.19**	**1.19**	**0.46**	**0.43**	**0.43**
Functional Units (acreage × actual points)	**4.3**	**5.1**	**2.0**	**1.9**	**1.9**

3.3.7 Photographic Documentation

Photographs of Photo-Points 1 through 3 (PP1–PP3), the transect start and end points, and the wetland determination data points (Figure A-7, Appendix A) are provided in Appendix C.

3.3.8 Maintenance Needs

Infestations of noxious weeds have decreased dramatically since 2016. Only two small areas of salt-cedar with low cover classes occur within the site (Figure A-8, Appendix A). Yearly control measures will continue to eliminate noxious weed infestations. The fence along the eastern side of the site was in good working order. No man-made water-control structures have been installed at the East site. A survey may be required to determine if the central area of the excavated area is higher than the northwestern and southeastern ends.

3.3.9 Current Credit Summary

The wetland acreage delineated in 2017 totaled 0.43 acre, which was a decrease of 0.76 acre since 2014. This decrease was likely driven by the below-average precipitation received at the site in 2015 and 2017 and, perhaps, slightly higher elevation in the central area of the excavation. Upland buffer accounted for 2.31 acres within the East site monitoring boundary. Applying standard wetland compensatory mitigation ratios [USACE, 2005], the site attained an estimated 0.89 credit acre, which is a decrease of 0.61 credit acre since 2014, as shown in Table 3-20. No performance standards have been established for this site.

Table 3-20. Credit Summary for the East Site

Habitat Type	Mitigation Ratio	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Credit Acres	2016 Delineated Acres	2016 Estimated Credit Acres	2017 Delineated Acres	2017 Estimated Credit Acres
Created Wetland	1:1	1.19	1.19	0.46	0.46	0.43	0.43	0.43	0.43
Upland Buffer	5:1	1.55	0.31	2.28	0.46	2.31	0.46	2.31	0.46
Total		**2.74**	**1.50**	**2.74**	**0.92**	**2.74**	**0.89**	**2.74**	**0.89**

3.4 TREASURE COUNTY LINE SITE – SITE 4

3.4.1 Hydrology

The average total annual precipitation recorded at the Forsyth, Montana, weather station (243098) from 1975 to through 2016 was 14.6 inches [Western Regional Climate Center, 2017]. The precipitation between January and August of 2016 totaled 16.77 inches, which is well above the long-term average of 12.03 inches. In 2017, precipitation between January and August totaled only 7.59 inches which is the fifth driest year since 1975 and nearly 4.5 inches below the long-term average. In coordination with the Montana Governor's Drought and Water Supply Advisory Committee, the Montana State Library publishes monthly maps of moisture by county. The July 2017 map shows Rosebud County to be Severely Dry. Additionally, the governor of Montana issued Executive Order 5-2017 on June 23, 2017, declaring a drought emergency to exist in eastern Montana. Later, under Executive Order No. 6-2017, the governor declared a drought disaster in Rosebud County and 13 other counties in Eastern Montana [DNRC, 2017].

The Treasure County Line site was constructed in 1999 adjacent to an existing wetland along Reservation Creek. The main source of wetland hydrology is a perennial, high groundwater table. Occasional overbank flooding, direct precipitation, and surface-water runoff provide additional hydrologic contributions. Obligate wetland vegetation communities were well developed within the wetland in 2017, which indicates more-than-adequate hydrology during the growing season. Hydrologic indicators recorded at this site include surface water, saturation, hydrogen sulfide odor, salt crust, saturation visible on aerial imagery, and geomorphic position.

Two data points (DP-1W and DP-1U) were assessed to determine the upland and wetland boundaries (Wetland Determination Data forms, Appendix B). DP-1W is located in a wetland expansion area along the western boundary. Positive wetland hydrology indicators recorded at this data point included saturation to the soil surface, hydrogen sulfide odor, salt crust, geomorphic position, and saturation visible on aerial imagery. No primary or secondary indicators of wetland hydrology were observed at DP-1U, which is located on the slope above the wetland edge.

3.4.2 Vegetation

A comprehensive list of 55 species that were identified during the 2013 through 2017 surveys is presented in Table 3-21. Five new species were identified at the site in 2017. The indicator status for

Table 3-21. Vegetation Species Observed at the Treasure County Line Site From 2013 Through 2017 (Page 1 of 2)

Scientific Names	Common Names	GP Indicator Status[a]
Agropyron cristatum	Crested Wheatgrass	NL
Algae, green	Algae, green	NL
Alopecurus pratensis	Field Meadow-Foxtail	FACW
Artemisia cana	Coaltown Sagebrush	FACU
Artemesia frigida	Fringed Sage	NL
Artemisia tridentata	Big Sagebrush	NL
Asclepias speciosa	Showy Milkweed	FAC
Bassia scoparia	Mexican-Fireweed	FACU
Bromus arvensis	Japanese Brome	FACU
Bromus ciliatus	**Fringed Brome**	**FAC**
Bromus tectorum	Cheatgrass	NL
Carduus nutans	**Nodding Plumeless-Thistle**	**FACU**
Carex sp.	Sedge	NL
Chenopodium album	Lamb's Quarters	FACU
Cirsium arvense	Canada Thistle	FACU
Cirsium vulgare	Bull Thistle	UPL
Distichlis spicata	Coastal Saltgrass	FACW
Elaeagnus angustifolia	Russian Olive	FACU
Eleocharis palustris	Common Spike-Rush	OBL
Elymus canadensis	Nodding Wild Rye	FACU
Elymus junceus	Russian Wild Rye	NL
Elymus repens	Creeping Wild Rye	FACU
Filago arvensis	Field Fluffweed	NL
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Foxtail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Lycopus asper	Rough Water-Horehound	OBL
Medicago sativa	Alfalfa	UPL
Melilotus officinalis	Yellow Sweet Clover	FACU
Mentha arvensis	American Field Mint	FACW
Muhlenbergia asperifolia	**Alkali Muhly**	**FACW**
Opuntia polyacantha	Plains Pricklypear	NL
Panicum capillare	Common Panic Grass	FAC
Pascopyrum smithii	Western Wheatgrass	FACU
Plantago patagonica	Woolly Plantain	NL
Poa bulbosa	**Bulbous Bluegrass**	**FACU**
Poa pratensis	Kentucky Bluegrass	FACU
Polygonum majus	Wiry Knotweed	NL
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL

Table 3-21. Vegetation Species Observed at the Treasure County Line Site From 2013 Through 2017 (Page 2 of 2)

Scientific Names	Common Names	GP Indicator Status[(a)]
Rumex crispus	Curly Dock	FAC
Salicornia rubra	Red Saltwort	OBL
Schedonorus pratensis	Meadow False Rye Grass	FACU
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Sisyrinchium (septentrionale[b])	**Blue-Eyed-Grass sp.**	**FAC**
Sonchus arvensis	Field Sow-Thistle	FAC
Sporobolus airoides	Alkali-Sacaton	FAC
Symphoricarpos albus	Common Snowberry	UPL
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-beard	NL
Typha latifolia	Broad-Leaf Cattail	OBL

(a) 2016 NWPL [Lichvar et al., 2016].
New species that were identified in 2017 are **bolded.**

(b) Only one of these potential species of concern was observed in the wetland area; our team will search for it in 2018 and identify if possible.

all of the plants was derived from the 2016 NWPL [Lichvar et al., 2016]. Two upland communities and two wetland vegetation communities were identified and mapped at the Treasure County Line site (Figure A-10, Appendix A). These communities included upland Type 5 – *Pascopyrum smithii/Bromus arvensis*, Type 6 – *Artemisia cana/Pascopyrum smithii,* wetland Type 3 – *Schoenoplectus* spp., and wetland Type 7 – *Distichlis spicata*/*Puccinellia nuttalliana*. The species composition for each community is included on the Treasure County Line site's Wetland Mitigation Site Monitoring form (Appendix B) and discussed in this section.

Upland community Type 5 – *Pascopyrum smithii/Bromus arvensis* (western wheatgrass/Japanese brome) was identified in upland areas that were not dominated by Coaltown sagebrush and on the two upland islands that remained intact during construction. This community replaced upland community Type 2 – *Elymus canadensis/Bromus tectorum* because of changes in species composition and their associated cover classes. Dominant species included Japanese brome, western wheatgrass, Russian wild rye (*Elymus junceus*), and lamb's quarters (*Chenopodium album*).

Upland community Type 6 – *Artemisia cana/Pascopyrum smithii* (Coaltown sagebrush/western wheatgrass) was mapped within the upland perimeter of the monitoring area and replaced Type 4 – *Artemesia cana/Bromus arvensis* in 2017. Coaltown sagebrush (*Artemisia cana*), Japanese brome, clasping pepperwort (*Lepidium perfoliatum*), and western wheatgrass are the dominant species.

Wetland community Type 3 – *Schoenoplectus* spp. (rush) was mapped within the excavated wetland cell as well as a newly observed wetland area near the northeastern project boundary. The

community was dominated by three-square club-rush (*Schoenoplectus pungens*), with lesser amounts of saltmarsh club-rush, foxtail barley (*hordeum jubatum*), broad-leaf cattail (*Typha latifolia*), coastal saltgrass (*Distichlis spicata*), and Nuttall's alkali grass. Approximately 90 percent of this community was saturated or inundated from 1 to 4 inches.

Wetland community Type 7 – *Distichlis spicata/Puccinellia nuttalliana* (coastal saltgrass/Nutall's alkali grass) is a new community in 2017 located along the north boundary. Dominant species includes coastal saltgrass, foxtail barley, and Nuttall's alkali grass. One blue-eyed-grass (*Sisyrinchium* sp.) plant was observed in community Type 7. In 2018, this species will be inventoried, photographed, and collected if several are available for collection. If the plant is determined to be Northern blue-eyed-grass (Sisyrinchium septentrionale), which is a Montana species of concern (S1S2), a rare plant form will be filed with the MTNHP and functional assessment ratings will be accordingly adjusted.

Vegetation cover was assessed along one transect at the Treasure County Line site in 2017 (Figure A-9, Appendix A). The data recorded on T-1 (Wetland Mitigation Site Monitoring forms, Appendix B) are summarized in tabular and graphical formats in Table 3-22 and Charts 3-11 and 3-12. Photographs of the transect start and end points are shown in Appendix C. T-1 is located near the center of the site, starts at the fence line along the northern mitigation boundary, extends approximately 534 feet across the excavated wetland and one of the upland islands, and terminates along the southern boundary of the monitoring area. The transect intervals alternated between wetland community Types 3 and 7 and upland community Type 5 – *Pascopyrum smithii/Bromus arvensis*. Approximately 43 percent of the transect was dominated by hydrophytic vegetation in 2017, which is an increase of 13.8 percent since 2014.

Table 3-22. T-1 Data Summary for the Treasure County Line Site From 2013 Through 2017

Monitoring Year	2013	2014	2015	2016	2017
Transect Length (feet)	**534**	**534**	**534**	**534**	**534**
Vegetation Community Transitions Along Transect	4	4	5	5	6
Vegetation Communities Along Transect	2	2	2	2	3
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	2
Total Vegetative Species	19	22	30	19	21
Total Hydrophytic Species	6	7	10	7	8
Total Upland Species	13	15	20	12	13
Estimated % Total Vegetative Cover	95	95	90	86	86
Estimated % Unvegetated	5	5	10	14	14
% Transect Length Comprising Hydrophytic Vegetation Communities	29.2	29.2	43	43	43
% Transect Length Comprising Upland Vegetation Communities	70.8	70.8	57	57	57
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0

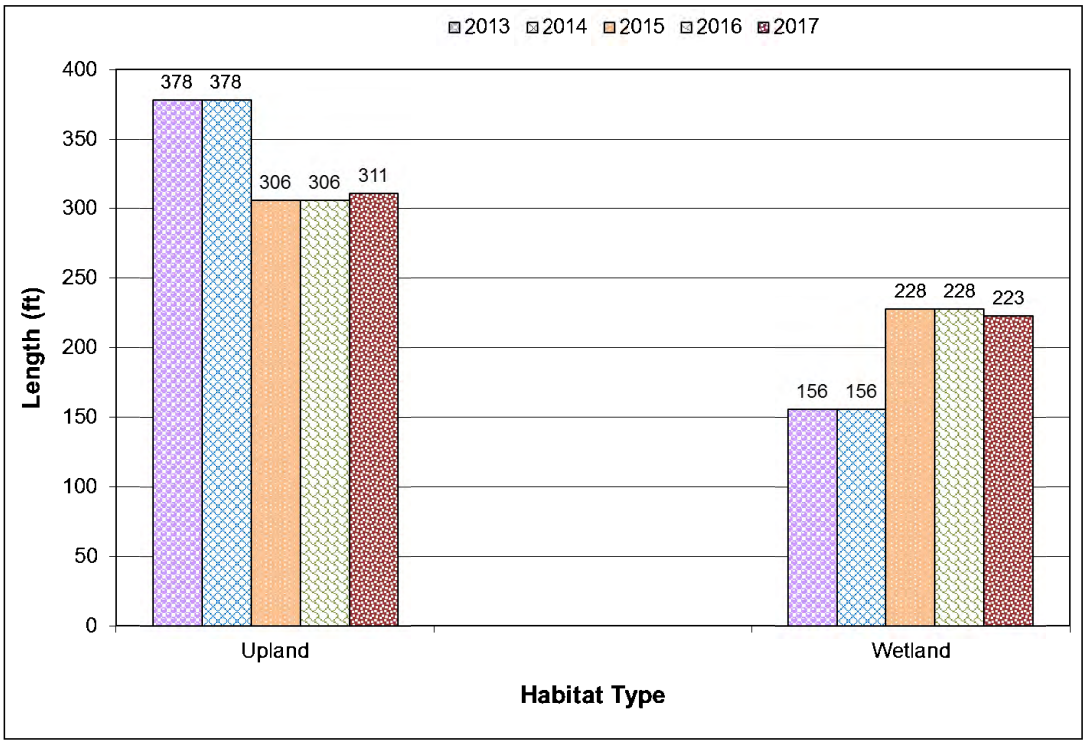


Chart 3-11. T-1 Map for the Treasure County Line Site Showing Vegetation Types From Transect Start (0 Foot) to Finish (534 Feet) From 2013 Through 2017.

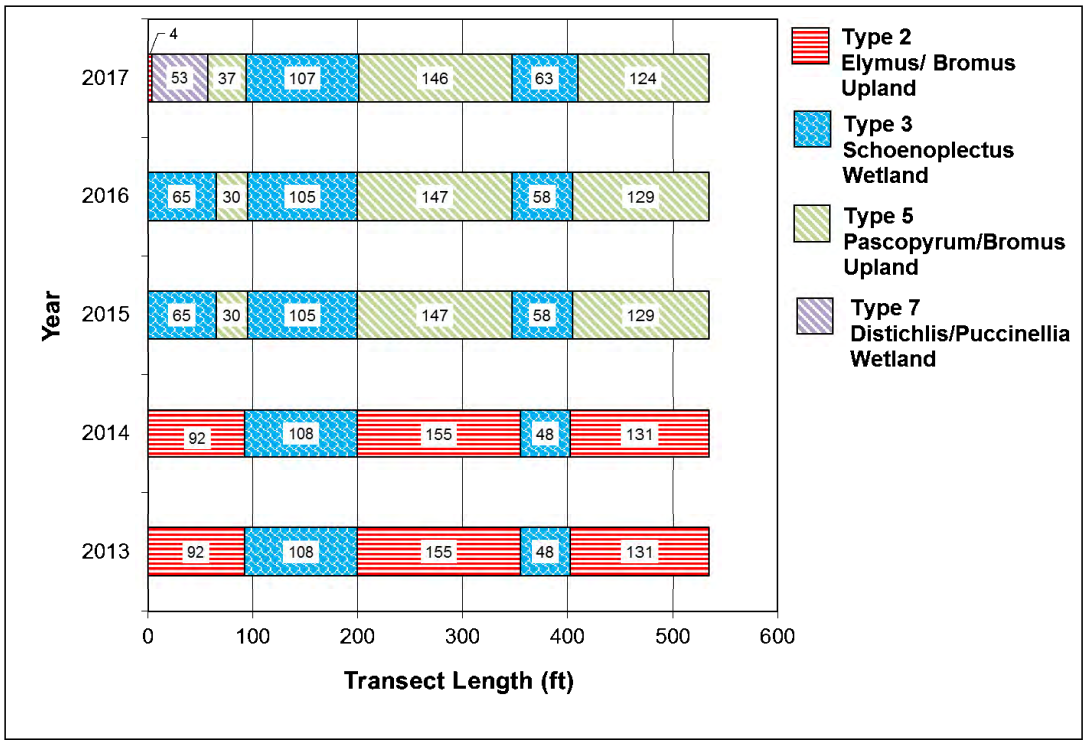


Chart 3-12. Length of Vegetation Communities Within T-1 at the Treasure County Line Site From 2013 Through 2017.

Four infestations of Canada thistle, which is a Priority 2B noxious weed, were identified within this site in 2017 and mapped on Figure A-10 (Appendix A). Noxious weed infestations have decreased considerably since 2016. No woody vegetation was installed at this site.

3.4.3 Soil

The Web Soil Survey for Rosebud County [US Department of Agriculture, 2011] indicates three soils occurring within the project site. These soils are identified as the Borollic Camborthids-Ustic Torrifluvents complex, Marvan silty clay (2–8 percent slope), and Gerdrum-Marvan silty clays (2–8 percent slope). The Borollic Camborthids-Ustic Torrifluvents complex and Marvan silty clay map units are located on the *Montana Hydric Soil List* [NRCS, 2014]. The Gerdrum and Marvan Series consist of very deep, well-drained, fine-textured soils that developed in alluvium or glacial fluvial deposits.

Soil test pits were excavated at two locations, both within what was originally mapped as the Borollic Camborthids-Ustic Torrifluvents complex (DP-1W andDP-1U; Figure A-9, Appendix A). DP-1W is located in a potential wetland expansion area along the western boundary. The soil profile revealed a dark grayish brown (10YR 4/2) clay with 15 percent dark yellowish brown (10YR 3/6), redoximorphic concentrations in the matrix. The soil met the criteria for depleted matrix (F3). DP-1U is located in community Type 5 – *Pascopyrum smithii/Bromus arvensis* upslope of the excavated wetland area. The soil profile revealed a very dark, grayish brown (10YR 3/2) clay and no hydric soil indicators.

3.4.4 Wetland Delineation

Two data points were evaluated in 2016 to determine the wetland and upland boundaries at the site (Figures A-9 and A-10, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data forms (Appendix B). The delineation identified 1.74 acres of wetland and 4.15 acres of upland buffer, which can be seen in Table 3-23. The excavated wetland basin supports a variety of hydrophytic species; according to observations of inundation during site visits from 2013 through 2017, this area is likely perennially inundated. This area is also adjacent to a preexisting natural wetland and has effectively increased the size of the overall wetland complex. The wetland boundary increased slightly (0.06 acre) since 2016.

Table 3-23. Wetland/Upland Habitat Acreages Delineated at the Treasure County Line Site From 2013 Through 2017

Wetland and Upland Habitats	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)	2017 (acres)
Project Area	5.89	5.89	5.89	5.89	5.89
Created Wetland	1.50	1.50	1.67	1.68	1.74
Upland Buffer	4.39	4.39	4.22	4.21	4.15

3.4.5 Wildlife

A list of wildlife species observed directly and indirectly at the site from 2013 through 2017 is presented in Table 3-24. Observed wildlife sign and bird activity codes were recorded on the

Wetland Mitigation Site Monitoring form (Appendix B). No species were observed in 2017 because of high temperatures and late afternoon conditions during the survey.

Table 3-24. Wildlife Species Observed at the Treasure County Line Site From 2013 Through 2017

Common Name	Scientific Name
Amphibians	
Frog sp.	*Rana* sp.
Northern Leopard Frog	*Rana pipiens*
Plains Garter Snake	*Thamnophis radix*
Birds	
American Goldfinch	*Spinus tristus*
Cliff Swallow	*Petrochelidon pyrrhonota*
Common Yellowthroat	*Geothlypis trichas*
Eastern Kingbird	*Tyrannus tyrannus*
Great Blue Heron	*Ardea herodias*
Killdeer	*Charadrius vociferus*
Mourning Dove	*Zenaida macroura*
Northern Harrier	*Circus cyaneus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Sandhill Crane	*Grus canadensis*
Song Sparrow	*Melospiza melodia*
Western Meadowlark	*Sturnella neglecta*
Wilson's Snipe	*Gallinago delicata*
Mammals	
Coyote	*Canis latrans*
Muskrat	*Ondatra zibethicus*

Species that were identified in 2017 are **bolded**.

3.4.6 Functional Assessment

The results of the functional assessments from 2013 through 2017 are summarized in Table 3-25, and the completed Treasure County Line site's MWAM form is included in Appendix B. The total aquatic habitat developed to date within the 5.89-acre project area is 1.74 acres. The Treasure County Line site was evaluated as one AA that encompasses the entire constructed wetland and rated as a Category III wetland with 59.4 percent of the total possible points and 9.3 functional units, which is an increase of 0.4 unit since 2015.

Table 3-25. Montana Wetland Assessment Method Summary for the Treasure County Line Site From 2013 Through 2017

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2013	2014	2015	2016	2017
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
General Wildlife Habitat	Mod (0.7)	High (0.9)	Mod (0.7)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	N/A	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
Short- and Long-Term Surface-Water Storage	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	High (1.0)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Sediment/Shoreline Stabilization	N/A	N/A	N/A	N/A	N/A
Production Export/Food Chain Support	Mod (0.4)	Mod (0.7)	Mod (0.5)	Mod (0.5)	Mod (0.5)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Uniqueness	Low (0.3)	Mod (0.4)	Low (0.3)	Low (0.3)	Low (0.3)
Recreation/Education Potential (bonus points)	High (0.15)	High (0.15)	High (0.15)	High (0.15)	Mod (0.1)
Actual Points/Possible Points	**4.95/8**	**5.85/8**	**5.35/9**	**5.35/9**	**5.3/9**
% of Possible Score Achieved	**61.9%**	**73.1%**	**59.4%**	**59.4%**	**59%**
Overall Category	**III**	**II**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands Within Site Boundaries	**1.50**	**1.50**	**1.67**	**1.68**	**1.74**
Functional Units (acreage × actual points)	**7.4**	**8.8**	**8.9**	**9.0**	**9.3**

3.4.7 Photographic Documentation

Photographs of Photo-Points 1 through 4 (PP1–PP4), the transect start and end points, and the wetland determination data points (Figure A-7, Appendix A) are provided in Appendix C.

3.4.8 Maintenance Needs

Four infestations of Canada thistle, which is a Priority 2B noxious weed, were identified within this site in 2017 (Figure A-10, Appendix A). These infestations are all located near the center of the site and have a low cover class (1-5% cover). No woody vegetation or man-made water-control structures were installed at this site. The fence that surrounds the mitigation area was in good working order when inspected in 2017. Cattle tracks were noted within community Type 7 along the northern side of the wetland, which resulted in bare ground cover of 20–50 percent.

3.4.9 Current Credit Summary

The 5.89-acre Treasure County Line site includes 1.74 acres of created wetland and 4.15 acres of upland buffer. Applying standard wetland compensatory mitigation ratios [USACE, 2005], the site has attained an estimated 2.57 credit acres, as described in Table 3-26.

Table 3-26. Credit Summary for the Treasure County Line Site

Habitat Type	Mitigation Ratio	2014 Delineated Acres	2014 Estimated Credit Acres	2015 Delineated Acres	2015 Estimated Credit Acres	2016 Delineated Acres	2016 Estimated Credit Acres	2017 Delineated Acres	2017 Estimated Credit Acres
Created Wetland	1:1	1.50	1.50	1.67	1.67	1.68	1.68	1.74	1.74
Upland Buffer	5:1	4.39	0.88	4.22	0.84	4.21	0.84	4.15	0.83
Total		**5.89**	**2.38**	**5.89**	**2.51**	**5.89**	**2.52**	**5.89**	**2.57**

3.5 COMPREHENSIVE CREDIT SUMMARY FOR FORSYTH – NORTHWEST

The wetland areas that were impacted during construction of the Volborg – North and South project in 2004 totaled 6.80 acres. Per the USACE requirement, the impacts were to be mitigated at a 1.5:1 ratio. During the construction of the FNW project, an additional 2.18 acres of unavoidable wetland impacts occurred. Credits that were generated by the 1999 construction of the Treasure County Line site have been applied to the FNW debits at a 1:1 ratio based on the development of this mitigation wetland site before the impacts actually occurred.

The total credits estimated for all four FNW sites in 2017 was 10.77 acres (Table 3-27). This value was 2.01 credit acres short of the required 12.78 credit acres. Continued wetland development at the West site is possible by installing a functioning dike, which will contribute over time to total credits generated by the FNW mitigation project. Minimal potential exists for wetland expansion at the Middle and Treasure County Line sites because development has already extended to near the margins of the excavated footprint. No quantitative metrics or performance criteria are associated with the success of these mitigation sites. The monitoring requirements that were identified within the approved mitigation plan are being satisfied.

Table 3-27. Credit/Debit Summary for the Forsyth – Northwest Project

Project Site	Actual Acres	Type	Debit Ratio	Debit Acres
Volborg – North and South	6.80	Debit	1.5:1	10.20
FNW Previously Mitigated	1.78	Debit	1:1[(a)]	1.78
FNW Remaining	0.40	Debit	2:1	0.80
Total	**8.98**	**Total Debits**		**12.78**
Mitigation Site	**Actual Acres**	**Mitigation Type**	**Credit Ratio**	**Credit Acres**
Site 1: West	4.60	Creation Credit	1:1	4.60
	1.29	Preservation Credit	4:1	0.32
	7.82	Upland Buffer Credit	5:1	1.56
Site 2: Middle	0.58	Creation Credit	1:1	0.58
	1.22	Upland Buffer Credit	5:1	0.24
Site 3: East	0.43	Creation Credit	1:1	0.43
	2.31	Upland Buffer Credit	5:1	0.46
Site 4: Treasure County Line	1.74	Previous Creation Credit	1:1	1. 74
	4.15	Upland Buffer Credit	5:1	0.83
Total	**24.14**	**Total Credits**		**10.77**
Net Credits				**–2.01**

(a) The wetland mitigation monitoring plan for FNW [2012] indicates that credits created at the Treasure County Line site will be applied to FNW impacts at a 1:1 ratio because the mitigation site was constructed before the impacts.

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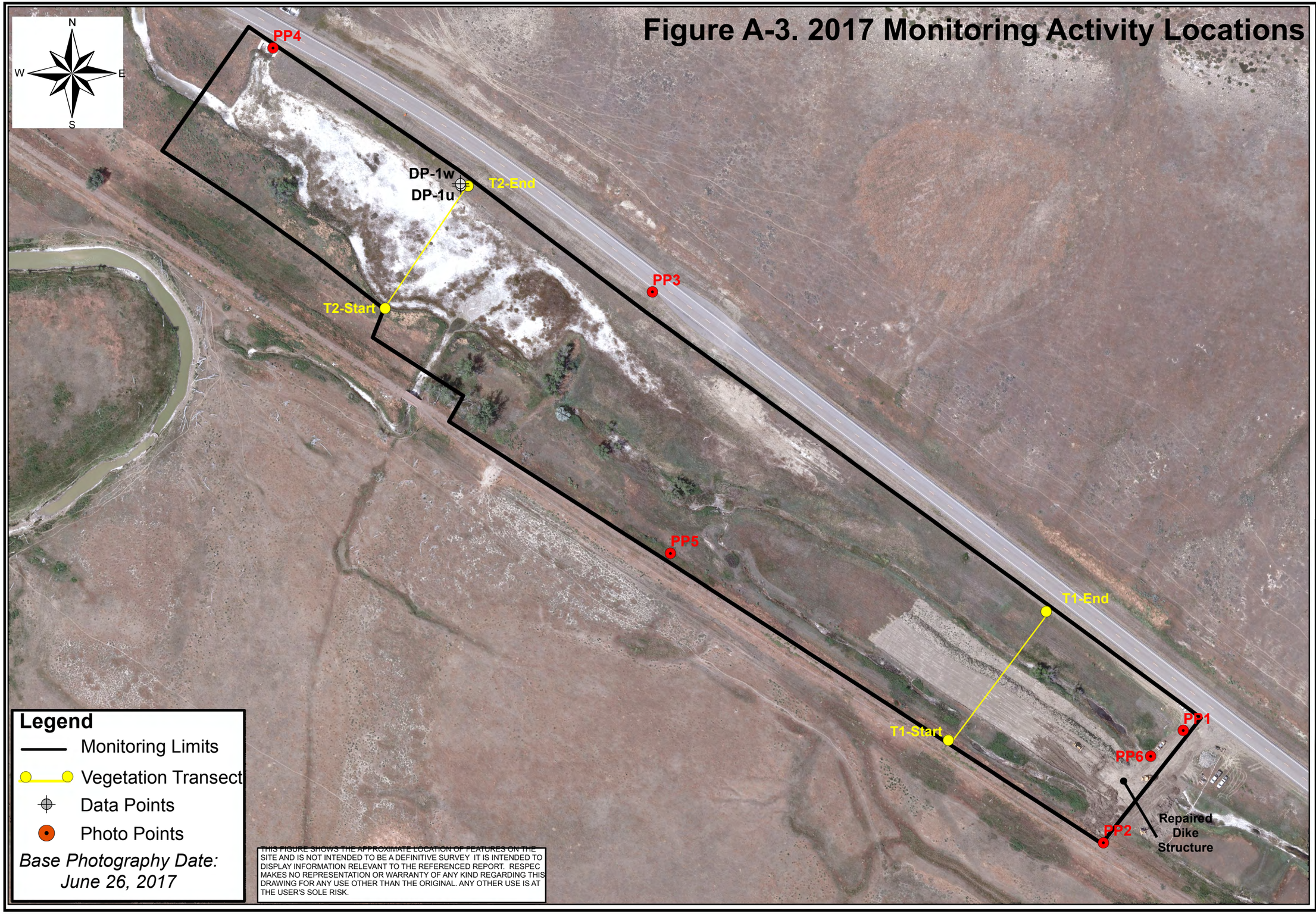
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APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Forsyth – Northwest
Rosebud County, Montana

Figure A-3. 2017 Monitoring Activity Locations



Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: June 26, 2017

THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY. IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

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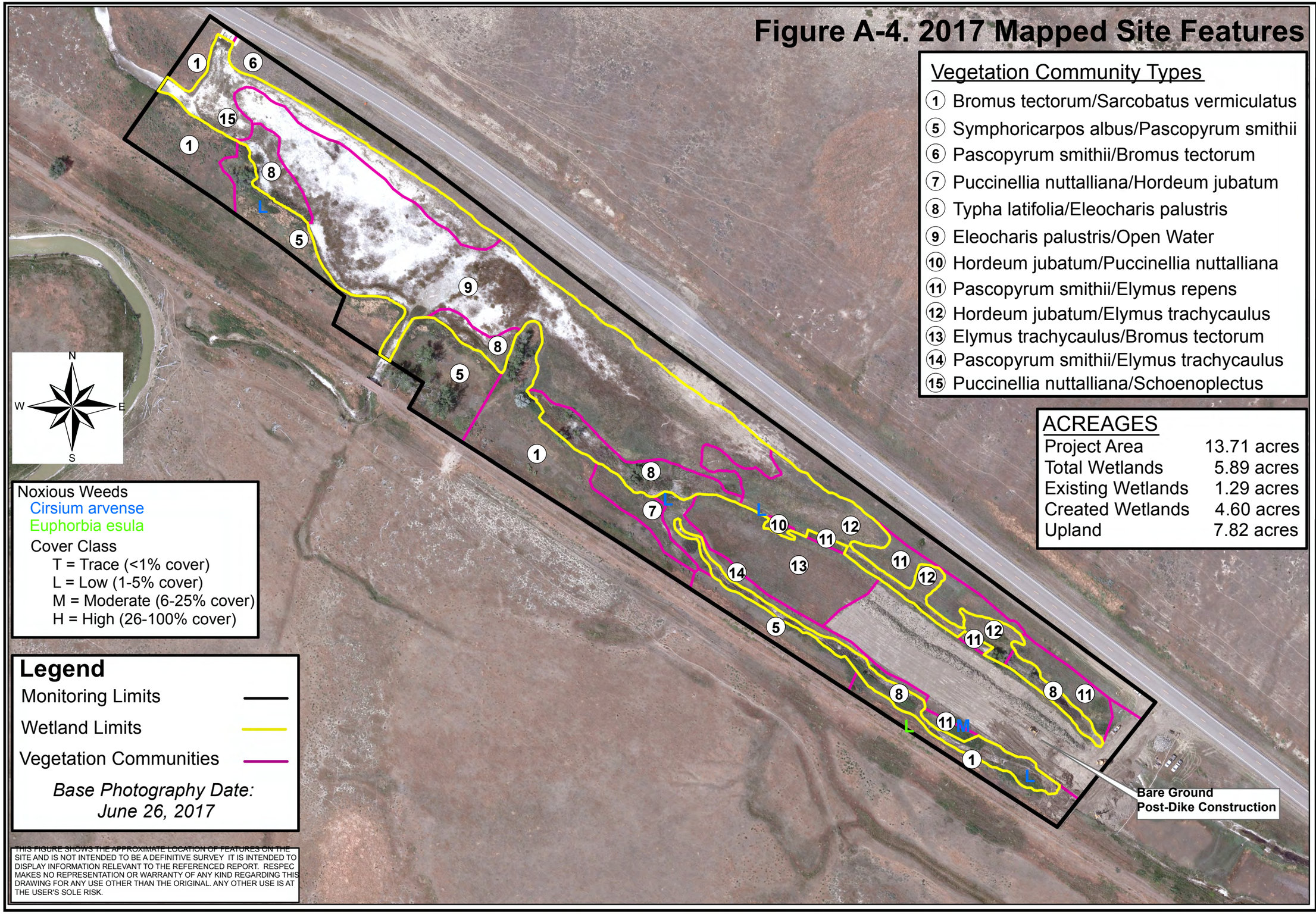
Forsyth NW - West Site
2017 Monitoring Activity Locations

0 65 130 260 390 520 650 Feet

Project:	STPP 14-6(9)259
Location:	Rosebud Co., Montana
Date:	December 2017
Project Manager:	M. Traxler
Drawn By:	J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Forsyth Northwest\GPS Data\Mains\West Site\Monitor2017.mxd

Figure A-4. 2017 Mapped Site Features



Vegetation Community Types

1. Bromus tectorum/Sarcobatus vermiculatus
5. Symphoricarpos albus/Pascopyrum smithii
6. Pascopyrum smithii/Bromus tectorum
7. Puccinellia nuttalliana/Hordeum jubatum
8. Typha latifolia/Eleocharis palustris
9. Eleocharis palustris/Open Water
10. Hordeum jubatum/Puccinellia nuttalliana
11. Pascopyrum smithii/Elymus repens
12. Hordeum jubatum/Elymus trachycaulus
13. Elymus trachycaulus/Bromus tectorum
14. Pascopyrum smithii/Elymus trachycaulus
15. Puccinellia nuttalliana/Schoenoplectus

ACREAGES

Project Area	13.71 acres
Total Wetlands	5.89 acres
Existing Wetlands	1.29 acres
Created Wetlands	4.60 acres
Upland	7.82 acres

Noxious Weeds
Cirsium arvense
Euphorbia esula
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (6-25% cover)
H = High (26-100% cover)

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: June 26, 2017

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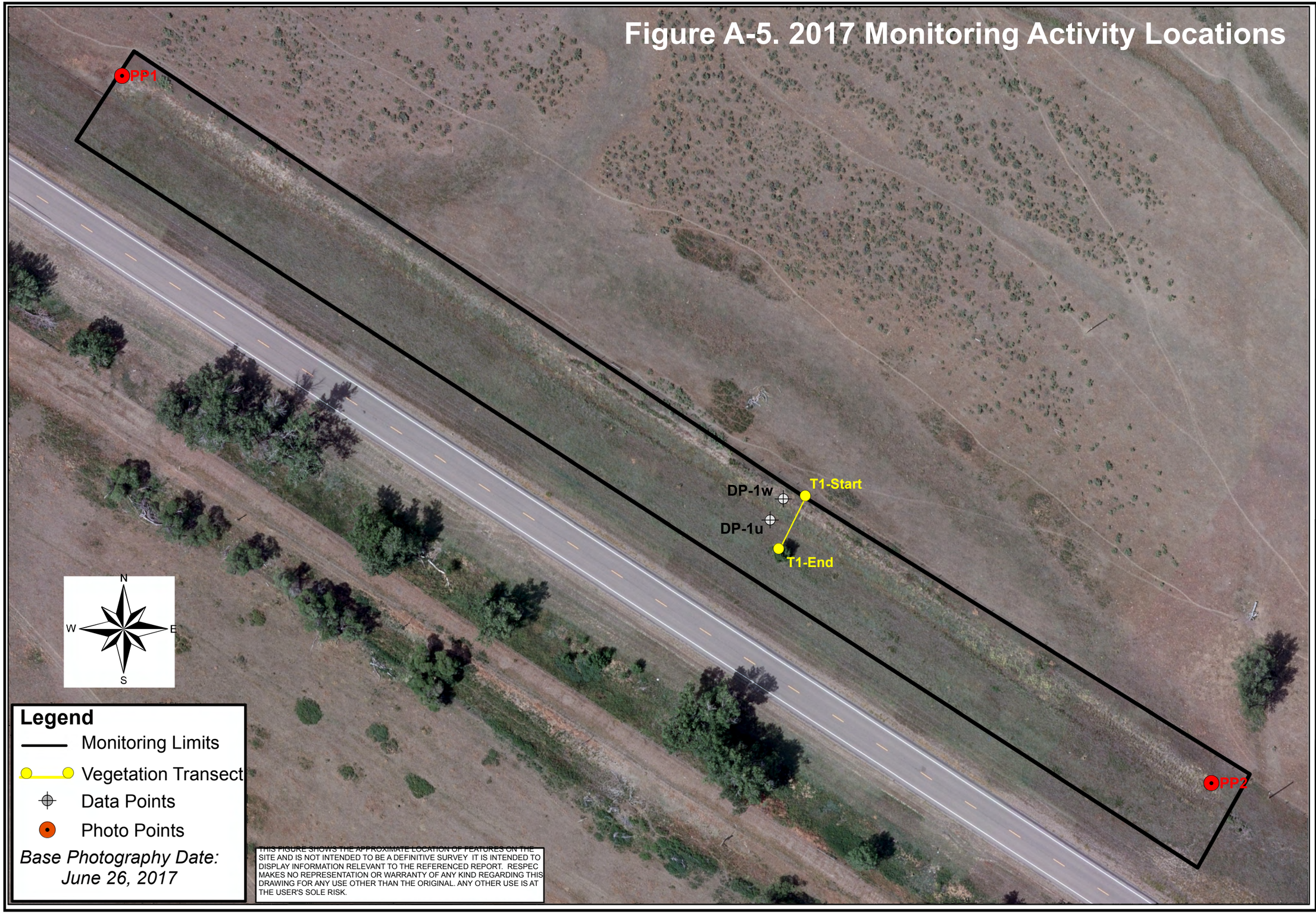
Forsyth NW - West Site
2017 Mapped Site Features

0 65 130 260 390 520 650 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2017
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

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Figure A-5. 2017 Monitoring Activity Locations



Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: June 26, 2017

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Forsyth NW - Middle Site
2017 Monitoring Activity Locations

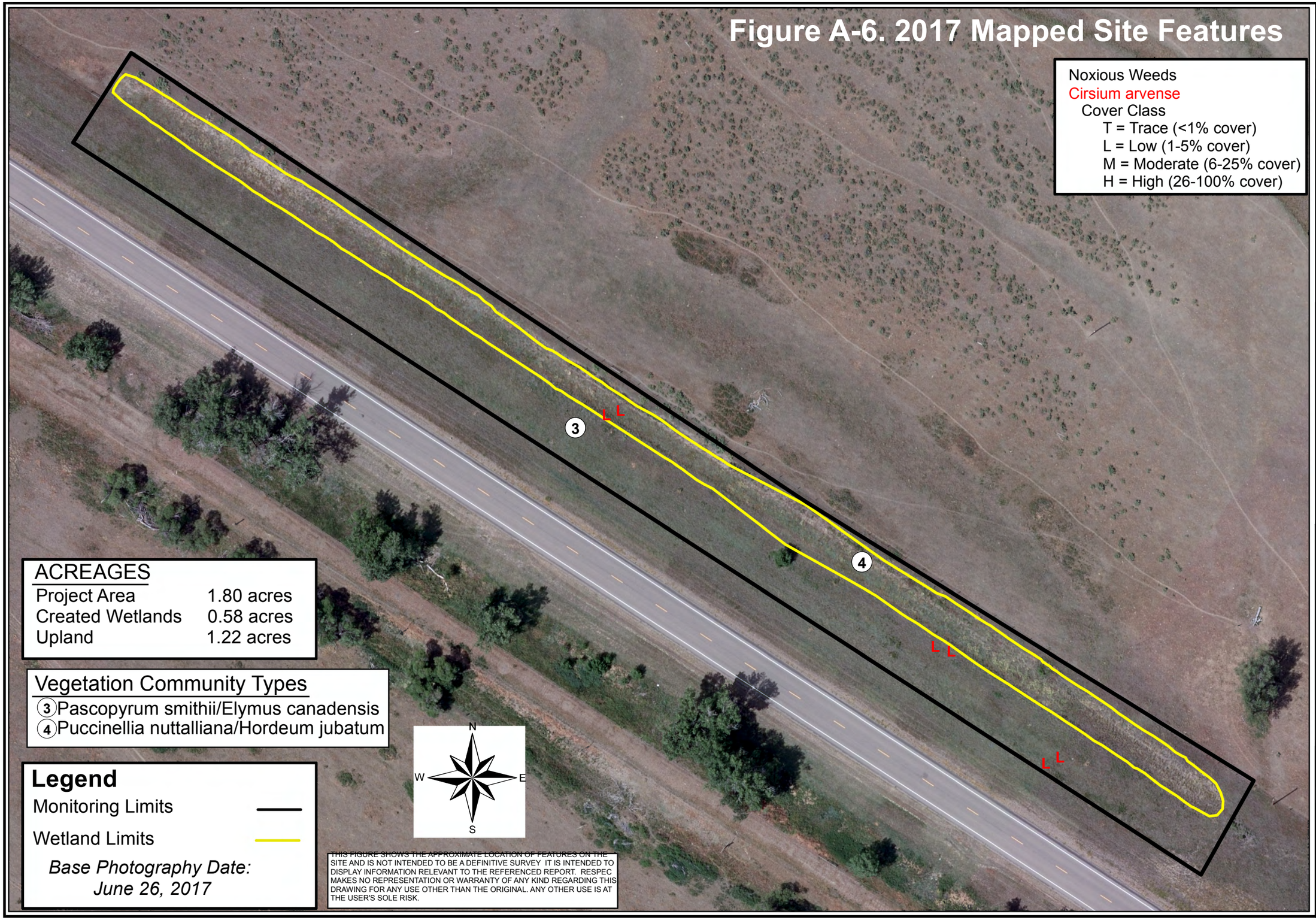
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Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2017
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

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Figure A-6. 2017 Mapped Site Features

Noxious Weeds
Cirsium arvense
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (6-25% cover)
H = High (26-100% cover)



ACREAGES	
Project Area	1.80 acres
Created Wetlands	0.58 acres
Upland	1.22 acres

Vegetation Community Types

(3) Pascopyrum smithii/Elymus canadensis
(4) Puccinellia nuttalliana/Hordeum jubatum

Legend

Monitoring Limits
Wetland Limits

Base Photography Date: June 26, 2017

N W E S

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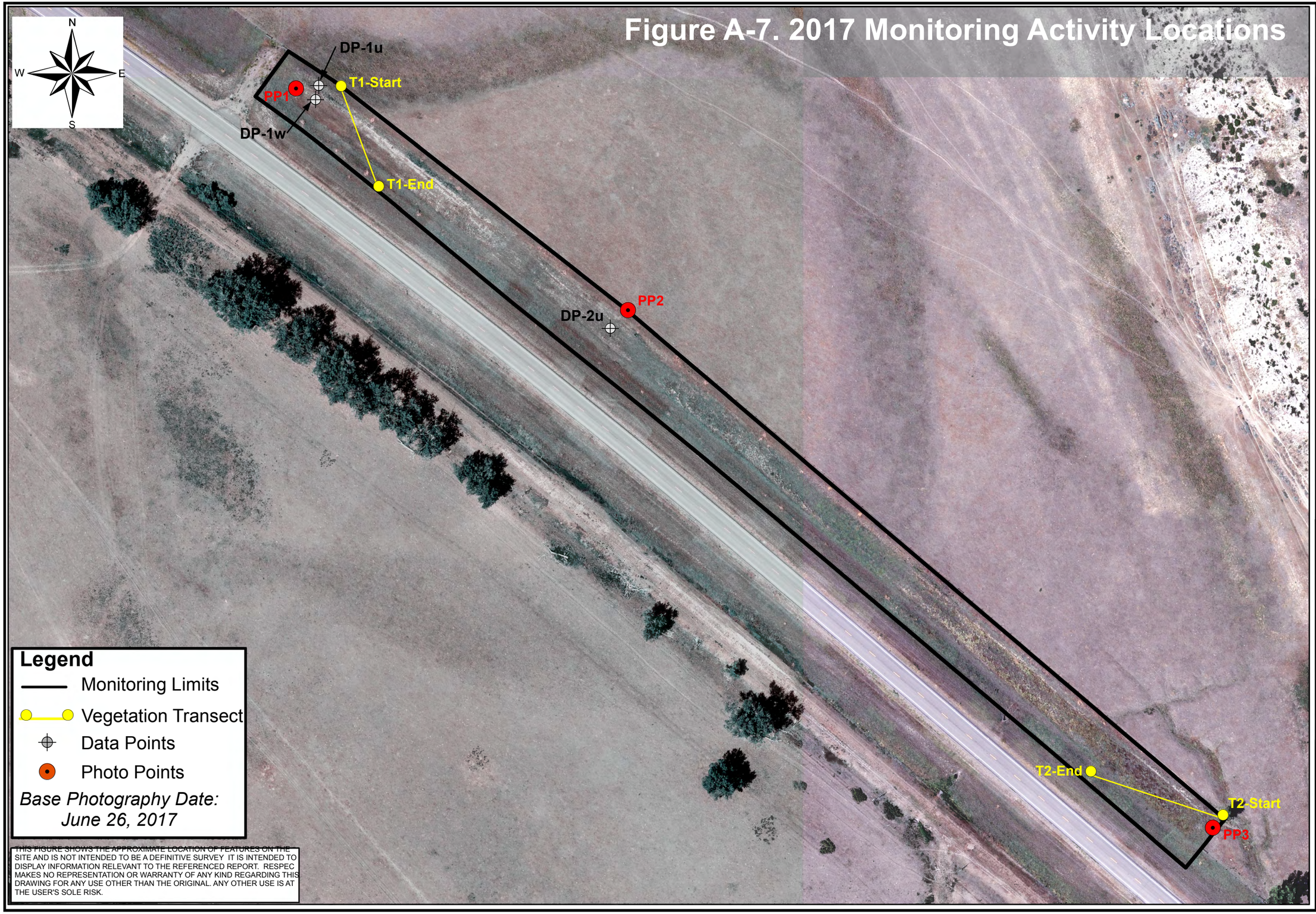
Forsyth NW - Middle Site
2017 Mapped Site Features

0 30 60 120 180 240 300 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2017
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\0290C MDT Monitoring 2016 - 2019\Forsyth Northwest\GIS Data\Maps\Middle Site\Veg2017.mxd

Figure A-7. 2017 Monitoring Activity Locations



Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: June 26, 2017

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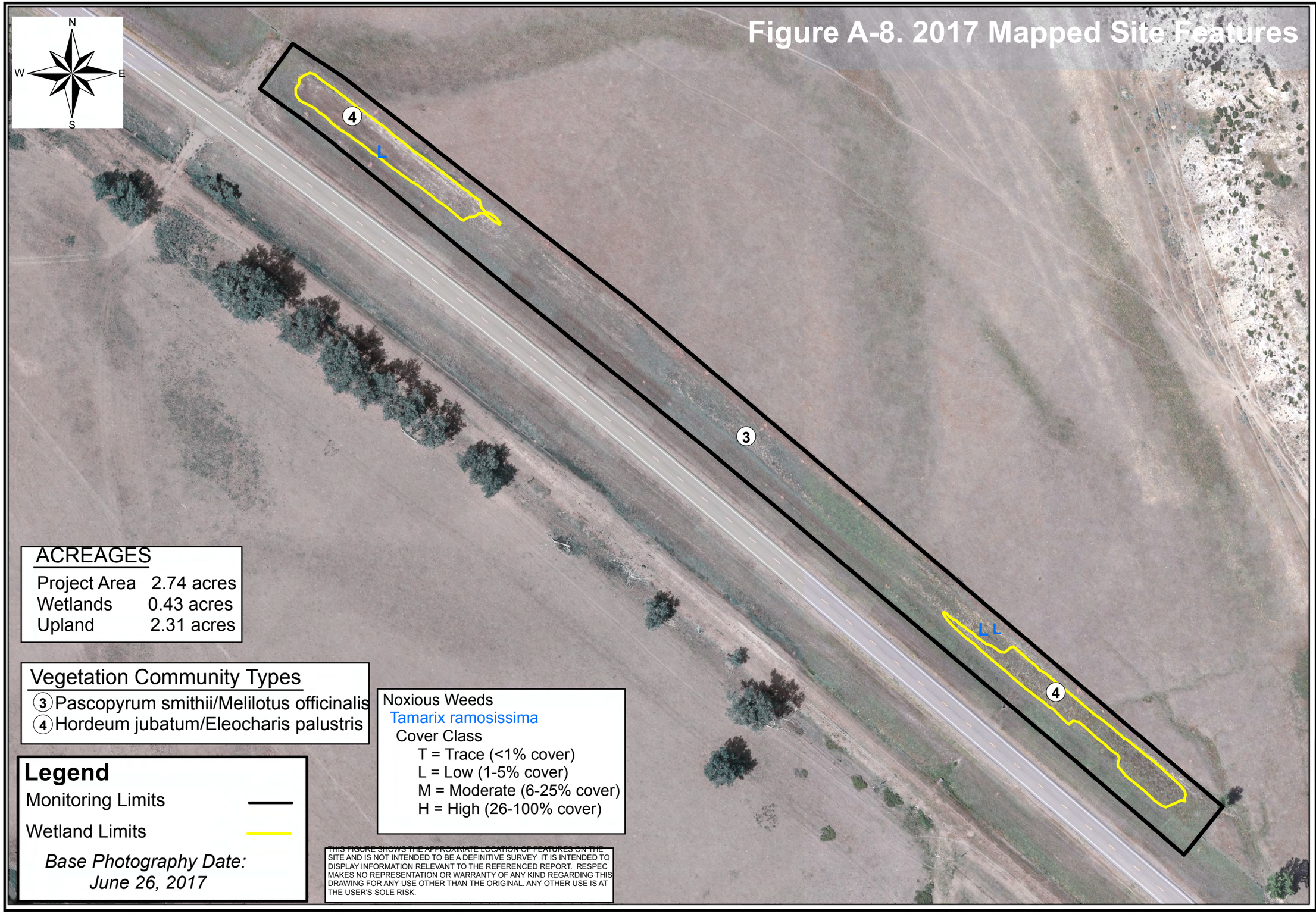
Forsyth NW - East Site
2017 Monitoring Activity Locations

0 50 100 200 300 400 500 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2017
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Forsyth Northwest\GPS Data\Mains\East Site\Monitor2017.mxd

Figure A-8. 2017 Mapped Site Features



ACREAGES

Project Area	2.74 acres
Wetlands	0.43 acres
Upland	2.31 acres

Vegetation Community Types

(3) Pascopyrum smithii/Melilotus officinalis
(4) Hordeum jubatum/Eleocharis palustris

Noxious Weeds
Tamarix ramosissima
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (6-25% cover)
H = High (26-100% cover)

Legend

Monitoring Limits
Wetland Limits

Base Photography Date: June 26, 2017

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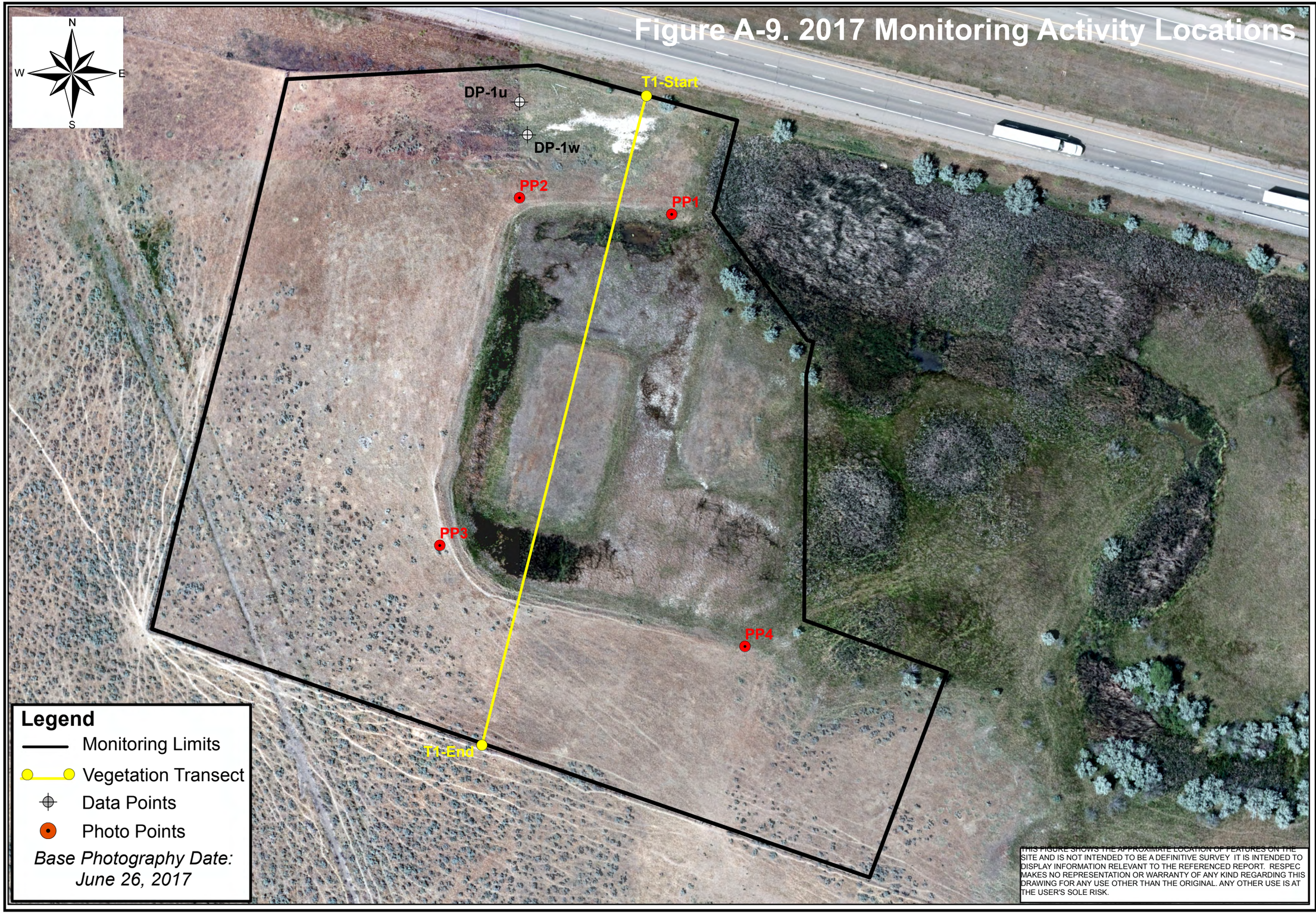
Forsyth NW - East Site
2017 Mapped Site Features

0 50 100 200 300 400 500 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2017
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

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Figure A-9. 2017 Monitoring Activity Locations



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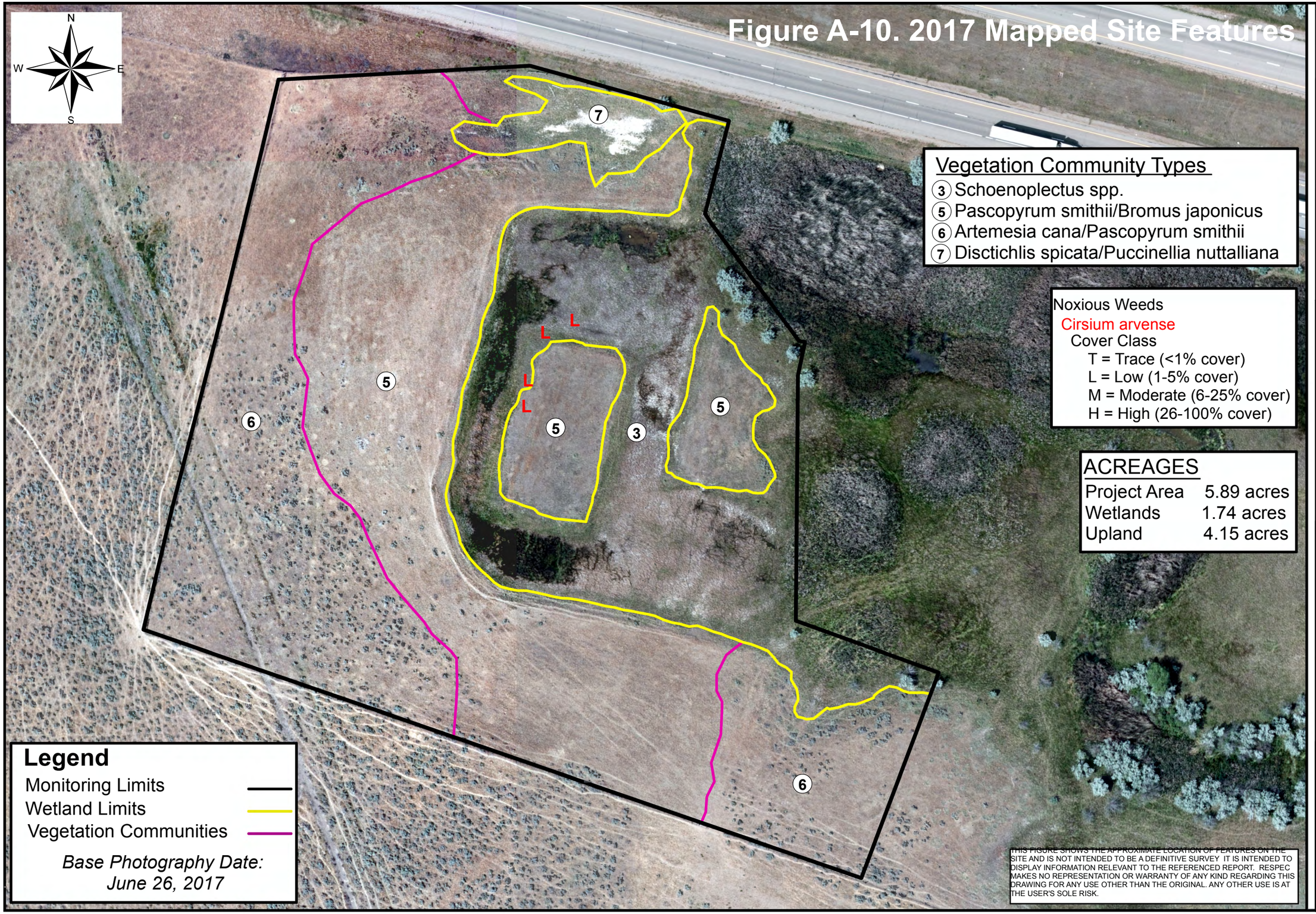
Forsyth NW - Treasure Co. Line Site
2017 Monitoring Activity Locations

0 30 60 120 180 240 300 Feet

Project: STPP 14-6(9)259
Location: Rosebud Co., Montana
Date: December 2017
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Forsyth Northwest\GPS Data\Mains\TreasureCoLine\Monitor2017.mxd

Figure A-10. 2017 Mapped Site Features



Vegetation Community Types

- (3) Schoenoplectus spp.
- (5) Pascopyrum smithii/Bromus japonicus
- (6) Artemesia cana/Pascopyrum smithii
- (7) Disctichlis spicata/Puccinellia nuttalliana

Noxious Weeds
Cirsium arvense
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (6-25% cover)
H = High (26-100% cover)

ACREAGES

Project Area	5.89 acres
Wetlands	1.74 acres
Upland	4.15 acres

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: June 26, 2017

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Forsyth NW - Treasure Co. Line Site
2017 Mapped Site Features

0 30 60 120 180 240 300 Feet

Project:	STPP 14-6(9)259
Location:	Rosebud Co., Montana
Date:	December 2017
Project Manager:	M. Traxler
Drawn By:	J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Forsyth Northwest\GPS Data\Mains\TreasureCoLine\Veg2017.mxd

APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
Forsyth – Northwest
Rosebud County, Montana

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Forsyth NW - West** Project Number: _____
Assessment Date: **July 24, 2017** Person(s) conducting the assessment: **Bacon/Hoschouer**
Location: **~15 miles NW of Forsyth** MDT District: **Glendive**
Milepost: **RP 280 on US 12**
Legal Description: T **7N** R **39E** Section **20 & 29**
Weather Conditions: **warm,sunny** Time of Day: **0700-1230**
Initial Evaluation Date: **August 15, 2013** Monitoring Year: **5** # Visits in Year: **1**
Size of evaluation area: **13.71 acres** Land use surrounding wetland: **Agriculture, grazing, US 12**

HYDROLOGY

Surface Water Source: **Periodic flooding from Big Porcupine Creek, surface runoff from East Spring Coulee, and seasonal high groundwater**
Inundation: **Present** Average Depth: **1 feet** Range of Depths: **0.5-3.5 ft**
Percent of assessment area under inundation: **0%**
Depth at emergent vegetation-open water boundary: **_____feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **No**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
Surface soil cracks, sediment deposits, drain patterns, water stained leaves, salt crust, geomorphic position, drift deposits, algal mat/crust, hydrogen sulfide odor.

Groundwater Monitoring Wells: **Absent**
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:
☐ Map emergent vegetation-open water boundary on aerial photograph.
☐ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☐ Use GPS to survey groundwater monitoring well locations, if present.

COMMENTS / PROBLEMS:
Mitigation area receives surface water when East Spring Creek Coulee produces surface flow and from periodic flooding of Big Porcupine Creek with potential for high water velocities through constructed wetland.

VEGETATION COMMUNITIES

Community Number: **1** Community Title (main spp): **Bromus tectorum / Sacobatus vermiculatus**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus tectorum	2 = 6-10%	Elymus repens	1 = 1-5%
Pascopyrum smithii	3 = 11-20%	Euphorbia esula	1 = 1-5%
Sarcobatus vermiculatus	2 = 6-10%	Thalspi arvense	1 = 1-5%
Schedonorus pratensis	2 = 6-10%	Bassia scoparia	1 = 1-5%
Bare Ground	1 = 1-5%	Chenopodium album	1 = 1-5%
Bromus inermis	1 = 1-5%	Hordeum jubatum	1 = 1-5%

Comments / Problems: _____

Community Number: **5** Community Title (main spp): **Symphocarpos albus / Pascopyrum smithii**

Dominant Species	% Cover	Dominant Species	% Cover
Pascopyrum smithii	5 = > 50%	Hordeum jubatum	1 = 1-5%
Symphoricarpos albus	2 = 6-10%	Chenopodium album	1 = 1-5%
Bassia scoparia	1 = 1-5%	Poa pratensis	3 = 11-20%
Bromus japonicus	1 = 1-5%	Sarcobatus vermiculatus	3 = 11-20%
Cirsium arvense	+ = < 1%	Thlaspi arvense	2 = 6-10%
Poa compressa	2 = 6-10%	Bromus inermis	1 = 1-5%

Comments / Problems: _____

Community Number: **6** Community Title (main spp): **Pascopyrum smithii / Bromus tectorum**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus tectorum	3 = 11-20%	Elymus trachycaulus	1 = 1-5%
Pascopyrum smithii	5 = > 50%	Lepidium perfoliatum	2 = 6-10%
Bromus japonicus	1 = 1-5%	Hordeum jubatum	1 = 1-5%
Melilotus officinalis	3 = 11-20%	Linum lewisii	1 = 1-5%
Bassia scoparia	2 = 6-10%	Thlaspi arvense	+ = < 1%
Elymus canadensis	1 = 1-5%	Hordeum marinum	+ = < 1%

Comments / Problems: **Elymus lanceolatus-1; Chenopodium album-1**

Community Number: **7** Community Title (main spp): **Puccinellia nuttalliana / Hordeum jubatum**

Dominant Species	% Cover	Dominant Species	% Cover
Hordeum jubatum	4 = 21-50%	Schedonorus pratensis	1 = 1-5%
Puccinellia nuttalliana	4 = 21-50%	Bare Ground	1 = 1-5%
Melilotus officinalis	2 = 6-10%	Elymus repens	1 = 1-5%
Bassia scoparia	1 = 1-5%	Glycyrrhiza lepidota	1 = 1-5%
Grindelia squarrosa	1 = 1-5%	Helianthus annuus	1 = 1-5%
Lactuca serriola	1 = 1-5%	Pascopyrum smithii	1 = 1-5%

Comments / Problems: _____

VEGETATION COMMUNITIES (continued)

Community Number: **8** Community Title (main spp): **Typha latifolia / Elocharis palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	5 = > 50%	Phalaris arundinacea	1 = 1-5%
Typha latifolia	3 = 11-20%	Salix amygdaloides	1 = 1-5%
Schoenoplectus acutus	+ = < 1%	Spartina pectinata	1 = 1-5%
Typha angustifolia	2 = 6-10%	Elymus repens	2 = 6-10%
Carex sp.	1 = 1-5%	Poa compressa	1 = 1-5%
Hordeum jubatum	2 = 6-10%	Rumex crispus	1 = 1-5%

Comments / Problems: **Populus deltoides (2ft tall)-<1%; Schoenoplectus maritimus-1; Sonchus arvensis-<1**

Community Number: **9** Community Title (main spp): **Eleocharis palustris / Open Water**

Dominant Species	% Cover	Dominant Species	% Cover
Dried mud (was open H20)	1 = 1-5%	Spartina pectinata	1 = 1-5%
Eleocharis palustris	3 = 11-20%	Salicornia rubra	2 = 6-10%
Typha latifolia	1 = 1-5%	Polygonum aviculare	+ = < 1%
Schoenoplectus maritimus	3 = 11-20%	Distichlis spicata	1 = 1-5%
Hordeum jubatum	1 = 1-5%	Populus deltoides	+ = < 1%
Puccinellia nuttalliana	2 = 6-10%	Chenopodium rubrum	1 = 1-5%

Comments / Problems: _____

Community Number: **10** Community Title (main spp): **Hordeum jubatum / Puccinellia nuttalliana**

Dominant Species	% Cover	Dominant Species	% Cover
Bare Ground	1 = 1-5%	Glycyrrhiza lepidota	1 = 1-5%
Hordeum jubatum	4 = 21-50%	Spartina pectinata	2 = 6-10%
Puccinellia nuttalliana	1 = 1-5%	Populus deltoides	+ = < 1%
Rumex crispus	1 = 1-5%	Cirsium arvense	+ = < 1%
Xanthium strumarium	1 = 1-5%	Salix lutea	+ = < 1%
Elymus trachycaulus	1 = 1-5%		

Comments / Problems: **Populus & Salix = <2' tall**

Community Number: **11** Community Title (main spp): **Pascopyrum smithii/Elymus repens**

Dominant Species	% Cover	Dominant Species	% Cover
Pascopyrum smithii	4 = 21-50%	Lactuca serriola	+ = < 1%
Schedonorus pratensis	2 = 6-10%	Populus deltoides	+ = < 1%
Chenopodium album	3 = 11-20%	Tragopogon dubius	+ = < 1%
Elymus repens	3 = 11-20%	Bromus tectorum	+ = < 1%
Cirsium arvense	+ = < 1%	Spartina pectinata	+ = < 1%
Grindelia squarrosa	+ = < 1%	Glycyrrhiza lepidota	+ = < 1%

Comments / Problems: **Populus 2 feet tall**

VEGETATION COMMUNITIES (continued)

Community Number: **12** Community Title (main spp): **Hordeum jubatum/Elymus trachycaulus**

Dominant Species	% Cover	Dominant Species	% Cover
Elymus repens	1 = 1-5%	Muhlenbergia asperifolia	+ = < 1%
Glycyrrhiza lepidota	2 = 6-10%		
Bare Ground	3 = 11-20%		
Hordeum jubatum	4 = 21-50%		
Elymus trachycaulus	3 = 11-20%		
Grindelia squarrosa	1 = 1-5%		

Comments / Problems: _____

Community Number: **13** Community Title (main spp): **Elymus trachycaulus/Bromus tectorum**

Dominant Species	% Cover	Dominant Species	% Cover
Poa pratensis	1 = 1-5%	Eymus lanceolatus	2 = 6-10%
Populus deltoides	1 = 1-5%	Bare ground	1 = 1-5%
Bromus tectorum	3 = 11-20%	Elymus repens	1 = 1-5%
Elymus trachycaulus	3 = 11-20%	Puccinellia nuttalliana	1 = 1-5%
Tragopogon dubius	1 = 1-5%		
Euphorbia esula	+ = < 1%		

Comments / Problems: **CT 7 has converted to CT 13 in 2017**

Community Number: **14** Community Title (main spp): **Pascopyrum smithii/Elymus lanceolatus**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus tectorum	2 = 6-10%	Pascopyrum smithii	3 = 11-20%
Elymus lanceolatus	1 = 1-5%		
Symphoriocarpos albus	1 = 1-5%		
Elymus trachycaulus	1 = 1-5%		
Linum lewisii	1 = 1-5%		
Ribes cereum	1 = 1-5%		

Comments / Problems: _____

Community Number: **15** Community Title (main spp): **Puccinellia nuttalliana/Schoenoplectus maritimus**

Dominant Species	% Cover	Dominant Species	% Cover
Puccinellia nuttalliana	5 = > 50%	Hordeum jubatum	+ = < 1%
Schoenoplectus maritimus	1 = 1-5%		
Bare dry soil (was open water)	4 = 21-50%		
Distichlis spicata	1 = 1-5%		
Polygonum aviculare	1 = 1-5%		
Salicornia rubra	+ = < 1%		

Comments / Problems: _____

Additional Activities Checklist:

☐ Record and map vegetative communities on aerial photograph.

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes

Comments / Problems: **No woody vegetation planted at site. Natural recruitment of cottonwood and willows is occurring.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - West** Date: **July 24, 2017** Examiner: **Lynn Bacon**
Transect Number: **1** Approximate Transect Length: **282 feet** Compass Direction from Start: **25˚** Note: _____

Transect Interval Length: **27 feet (station 0-27)**	
Vegetation Community Type: 5: Symphoriocarpos albus/Pascopyum smithii	
Plant Species	**Cover**
Bromus tectorum	5 = > 50%
Poa pratensis	2 = 6-10%
Euphorbia esula (sprayed, some remain partially alive)	1 = 1-5%
Pascopyrum smithii	2 = 6-10%
Chenopodium album	2 = 6-10%
Descurainia sophia	1 = 1-5%
Lepidium perfoliatum	1 = 1-5%
Bare	5 = > 50%
Total Vegetative Cover:	95%

Transect Interval Length: **32 feet (station 27-59)**	
Vegetation Community Type: 8:Typha latifolia / Eleocharis palustris	
Plant Species	**Cover**
Eleocharis palustris	4 = 21-50%
Spartina pectinata	3 = 11-20%
Hordeum jubatum	5 = > 50%
Elymus repens	1 = 1-5%
Chenopdium album	1 = 1-5%
Bare	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **6 feet (station 59-65)**	
Vegetation Community Type: 11:Pascopyrum smithii/Elymus repens	
Plant Species	**Cover**
Pascopyrum smithii	5 = > 50%
Bromus tectorum	4 = 21-50%
Thlaspi arvense	+ = < 1%
Bare (litter)	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **115 feet (station 65-180)**	
Vegetation Community Type: Bare Ground	
Plant Species	**Cover**
Bare	5 = > 50%
(recent construction)	
Total Vegetative Cover:	0%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - West** Date: **July 24, 2017** Examiner: **Lynn Bacon**
Transect Number: **1** Approximate Transect Length: **282 feet** Compass Direction from Start: **25˚** Note: _____

Transect Interval Length: **30 feet (station 180-210)**	
Vegetation Community Type: 11: Pascopyrum smithii/Elymus repens	
Plant Species	**Cover**
Hordeum jubatum	1 = 1-5%
Glychirrhiza lepidota	1 = 1-5%
Elymus repens	5 = > 50%
(transect crossed a high spot in ditch that did not	
qualify as wetland)	
Total Vegetative Cover:	100%

Transect Interval Length: **34 feet (station 210-244)**	
Vegetation Community Type: 12:Hordeum jubatum/Elymus trachycaulus	
Plant Species	**Cover**
Hordeum jubatum	5 = > 50%
Elymus trachycaulus	3 = 11-20%
Bare Ground	3 = 11-20%
Elymus repens	1 = 1-5%
Glycyrrhiza lepidota	2 = 6-10%
Grindelia squarrosa	1 = 1-5%
Muhlenbergia asperifolia	1 = 1-5%
Total Vegetative Cover:	80%

Transect Interval Length: **38 feet (station 244-282**	
Vegetation Community Type: 6:Pascopyrum smithii / Bromus tectorum	
Plant Species	**Cover**
Elymus lanceolatus	2 = 6-10%
Pascopyrum smithii	4 = 21-50%
Bare Ground	1 = 1-5%
Bromus tectorum	4 = 21-50%
Chenopodium album	1 = 1-5%
Lepidium perfoliatum	1 = 1-5%
Linum lewisii	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length:	
Vegetation Community Type:	
Plant Species	**Cover**
Total Vegetative Cover:	

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - West** Date: **July 24, 2017** Examiner: **Lynn Bacon**
Transect Number: **2** Approximate Transect Length: **261 feet** Compass Direction from Start: **25˚** Note: _____

Transect Interval Length: **9 feet (station 0-9)**	
Vegetation Community Type: 5: Symphoricarpos albus / Pascopyrum smithii	
Plant Species	**Cover**
Symphoricarpos albus (sprayed at transect location?)	+ = < 1%
Elymus repens	4 = 21-50%
Lepidium perfoliatum	3 = 11-20%
Poa compressa	4 = 21-50%
Thlapsi arvensis	1 = 1-5%
Pascopyrum smithii	1 = 1-5%
Bare	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **195 feet (station 9-204**	
Vegetation Community Type: 9: Eleocharis palustris / Open Water	
Plant Species	**Cover**
Eleocharis palustris	5 = > 50%
Schoenoplectus maritimus	5 = > 50%
Bare Ground (dried mud-was open water)	1 = 1-5%
Chenopodium rubrum	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Puccinellia nuttalliana	2 = 6-10%
Alopecurus arundinaceus	+ = < 1%
Spartina pectinata	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length: **33 feet (station 204-237)**	
Vegetation Community Type: 15: Puccinellia nuttalliana /Schoenoplectus maritimus	
Plant Species	**Cover**
Puccinellia nuttalliana	5 = > 50%
Schoenoplectus maritimus	1 = 1-5%
Mud Flat (dried mud-was open water)	4 = 21-50%
Distichlis spicata	1 = 1-5%
Salicornia rubra	+ = < 1%
Hordeum jubatum	+ = < 1%
Polygonum aviculare	1 = 1-5%
Total Vegetative Cover:	75%

Transect Interval Length: **24 feet (station 237-261)**	
Vegetation Community Type: 6: Pascopyrum smithii / Bromus tectorum	
Plant Species	**Cover**
Elymus lanceoatus	1 = 1-5%
Bromus tectorum	1 = 1-5%
Bare Ground	1 = 1-5%
Melilotus officinale	4 = 21-50%
Lepidium perfoliatum	1 = 1-5%
Pascopyrum smithii	5 = > 50%
Basia scoparia	1 = 1-5%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		Indicator Class	Source
+ = < 1%	3 = 11-10%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = > 50%	0 = Facultative	

Percent of perimeter developing wetland vegetation (excluding dam/berm structures): **43%**

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 foot depth (in open water), or at the point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 foot wide "belt" along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

Comments: **Southwest dike was repaired in spring 2017, photos taken (see report). Area midway along dike and north was disturbed (115 feet of "Bare Ground" along Transect 1) during restoration efforts.**

PHOTOGRAPHS

Take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph Checklist:

- ☒ One photograph for each of the four cardinal directions surrounding the wetland.
- ☒ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.
- ☒ At least one photograph showing the buffer surrounding the wetland.
- ☒ One photograph from each end of the vegetation transect, showing the transect.

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1 (Pano): 46.336914 / -106.871132	270
PP-2		Photo Point 2 (Pano): 46.336468 / -106.871811	350
PP-3		Photo Point 3 (Pano): 46.339088 / -106.874611	230
PP-4		Photo Point 4 (Pano): 46.340237 / -106.877312	210
PP-5		Photo Point 5 (Pano): 46.337817 / -106.874587	45
T-1 start		Transect 1 start: 46.33691 / -106.872772	25
T-1 end		Transect 1 end: 46.337456 / -106.872063	205
T-2 start		Transect 2 start: 46.339001 / -106.87645	25
T-2 end		Transect 2 end: 46.339561 / -106.875854	205
DP-1W		Wetland soil pit: 46.338328 / -106.873779	
DP-1U		Upland soil pit: 46.338398 / -106.87372	
PP-6		Completed Dike	315
PP-6a		Completed Dike	135

Comments / Problems: _____

GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points set at a 5 second recording rate. Record file numbers for site in designated GPS field notebook.

GPS Checklist:

- ☒ Upland/wetland boundary.
- ☒ 4-6 landmarks that are recognizable on the aerial photograph.
- ☒ Start and End points of vegetation transect(s).
- ☒ Photograph reference points.
- ☐ Groundwater monitoring well locations.
- ☐ Bird nest boxes.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual and regional supplement.
- ☒ Delineate wetland – upland boundary onto aerial photograph.

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

- ☒ Complete and attach full MDT Montana Wetland Assessment Method field forms.

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **NA**
If yes, do they need to be repaired? **NA**
If yes, describe the problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: _____

WILDLIFE

Birds

Were man-made nesting structures installed? **No**
If yes, type of structure: _____ How many? **0**
Are the nesting structures being used? **NA**
Do the nesting structures need repairs? **NA**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
Deer sp.		☒	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: _____

BIRD SURVEY – FIELD DATA SHEET

Site: **Forsyth NW - West** Date: **7/24/17**
Survey Time: **0700** to **1230**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Western Kingbird	6	F FO	UP				
Western Meadowlark	1	FO	UP				
Cliff Swallow	6	FO F	MA				
House Wren	2	F	FO				

BEHAVIOR CODES
BP = One of a breeding pair
BD = Breeding display
F = Foraging
FO = Flyover
L = Loafing
N = Nesting

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **95 degrees, sunny = few avian species heard or observed**

Notes: _____

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West | City/County: Rosebud | Sampling Date: 7/24/17

Applicant/Owner: MDT | State: MT | Sampling Point: DP-1u

Investigator(s): L. Bacon, C. Hoschouer | Section, Township, Range: S20 T7N R39E

Landform (hillside, terrace, etc.): slope | Local relief (concave, convex, none): convex | Slope (%): 2

Subregion (LRR): LRR G | Lat: 46.338398 | Long: -106.87372 | Datum: WGS84

Soil Map Unit Name: Marvan silty clay, 0-2% slopes | NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Road embankment is an upland community; wetland vegetation has colonized up to the bottom of embankment.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: ____)			
1. *Pascopyrum smithii*	50	Yes	FACU
2. *Melilotus albus*	45	Yes	FACU
3. *Lepidium perfoliatum*	1	No	FAC
4. *Bromus tectorum*	1	No	UPL
5. *Hordeum jubatum*	1	No	FACW
6.			
7.			
8.			
9.			
10.			
	98 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	1	x 2 =	2
FAC species	1	x 3 =	3
FACU species	95	x 4 =	380
UPL species	1	x 5 =	5
Column Totals:	98 (A)		390 (B)
Prevalence Index = B/A =			3.98

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:
Slopes dry, some bare ground occurs in patches.

SOIL

Sampling Point: DP-1u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	2.5Y 4/3	50	2.5Y 4/2	50			Loamy/Clayey	No redox, mixed matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No saturation on road embankment.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No evidence of primary or secondary indicators.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West | City/County: Rosebud | Sampling Date: 7/24/17

Applicant/Owner: MDT | State: MT | Sampling Point: DP-1w

Investigator(s): L. Bacon, C. Hoschouer | Section, Township, Range: S20 T7N R39E

Landform (hillside, terrace, etc.): floodplain | Local relief (concave, convex, none): concave | Slope (%): 0

Subregion (LRR): LRR G | Lat: 46.338328 | Long: -106.873779 | Datum: WGS84

Soil Map Unit Name: Marvan silty clay, 0-2% slopes | NWI classification: Not maapped

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
DP located on very edge of WL/UP transition zone, evidence of several secondary hydrology indicators and dominant hydrophytic community.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: ____)			
1. *Puccinellia nuttalliana*	40	Yes	OBL
2. *Bassia scoparia*	10	No	FACU
3. *Hordeum jubatum*	1	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	51 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	1	x 2 =	2
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	51 (A)		82 (B)
Prevalence Index = B/A =			1.61

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:
Bare ground was open water in the spring (cracked soil). DP on very edge of wet/up zone transition.

SOIL

Sampling Point: DP-1w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 4/3	100					Loamy/Clayey	
8-16	2.5Y 3/3	80	2.5Y 3/2	20			Loamy/Clayey	not redox, soil matrix is mixed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ? Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soil likely mixed as DP is located on the edge of road embankment and excavated wetland area. OTHER: DP located in area of positive secondary indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Survey conducted in mid-summer of a very hot and drought-declared area. Several positive secondary indicators evident, however.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Forsyth NW - West **2. MDT Project #:** STPP 14-6(9)259 **3. Control #:** 4059

3. Evaluation Date: 7/24/17 **4. Evaluator(s):** Lynn Bacon **5. Wetland/Site #(s):** Forsyth NW - West

6. Wetland Location(s): Township 7 N, Range 39 E, Section 20; Township 7 N, Range 39 E, Section 29

Approximate Stationing or Roadposts: RP 280 on US 12

Watershed: 14 - Middle Yellowstone **County:** Rosebud

7. Evaluating Agency: RESPEC for MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other _____**

8. Wetland Size (acre): _____ (visually estimated)
5.89 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 6.01 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Riverine	Emergent Wetland		Permanent / Perennial	17
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	45
Depressional	Forested Wetland		Seasonal / Intermittent	5
Depressional	Aquatic Bed	Excavated	Seasonal / Intermittent	30
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	3

Comments: Emergent, Aquatic Bed, and Forested classes all represented

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
common

12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	---	---	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	---	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	high disturbance	---

Comments (types of disturbance, intensity, season, etc.)**:** Construction activities in 2017 to repair the dike structure increased disturbance rating at the site to high.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Euphorbia esula, Convolvulus arvensis, Cirsium arvense, Tamarix ramosissima

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA includes existing and constructed wetlands within floodplain of an Unnamed Tributary of Big Porcupine. Surrounding land includes US 12 and livestock grazing.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Emergent wetland with occasional trees and shrubs, as well as open water with aquatic macrophytes.

Wetland/Site #(s): Forsyth NW - West

14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	---	0L

Sources for documented use (e.g. observations, records): _____

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☒ D ☐ S Ammannia robusta (S2)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☒ S Great Blue Heron (S3)
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	.0L
S2 and S3 Species Functional Point/Rating	.9H	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): Ammannia observed within AA in previous year.

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☒ ***Moderate:*** Based on any of the following [check].
- ☒ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☒ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

Structural Diversity (see #13)	☐ High				☒ Moderate								☐ Low			
Class Cover Distribution (all vegetated classes)	☐ Even				☐ Uneven				☐ Even				☒ Uneven				☐ Even			
Duration of Surface Water in ≥ 10% of AA	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**
☐ **Low Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	L	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	Wildlife Habitat Features Rating (ii)			
	☐ Exceptional	☐ High	☐ Moderate	☒ Low
☒ **Substantial**	---	---	---	.7M
☐ **Moderate**	---	---	---	---
☐ **Minimal**	---	---	---	---

Comments: Extreme heat during survey resulted in fewer wildlife observations than in previous years but wildlife sign was common.

Wetland/Site #(s): Forsyth NW - West

14D. GENERAL FISH HABITAT ☐ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☒ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface Water in AA	☐ **Permanent / Perennial**						☒ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☒ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	.3L	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

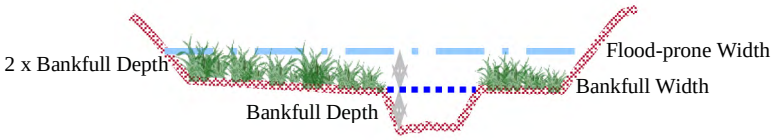
iii. Final Score and Rating: .3L **Comments:** Unidentified 3-inch fish observed during field survey in 2015; unlikely spawning habitat.

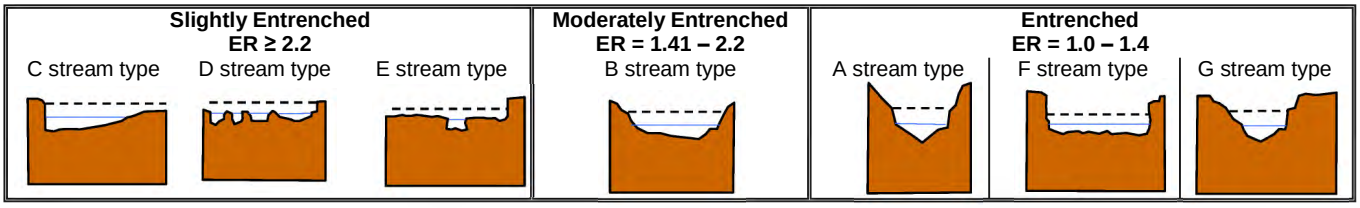
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	☒ Slightly Entrenched C, D, E stream types			☐ Moderately Entrenched B stream type			☐ Entrenched A, F, G stream types		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☒ <25%	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	.6M	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** Surface water enters AA via box culvert and from overbank flow from Big Porcupine Creek; dike upgraded on SE end of wetland in 2017.

Wetland/Site #(s): Forsyth NW - West

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual for further definitions of these terms].

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☒ **>5 acre feet**			☐ **1.1 to 5 acre feet**			☐ **≤1 acre foot**		
Duration of Surface Water at Wetlands within the AA	☐ **P/P**	☒ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	---	.9H	---	---	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: A large area of the AA is seasonally flooded by East Spring Coulee.

14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	1H	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: Open/standing water was present in depressional aquatic bed during field survey.

14H. SEDIMENT / SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of ≥6 (see Appendix F).	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☐ **Permanent / Perennial**	☒ **Seasonal / Intermittent**	☐ **Temporary / Ephemeral**
☐ **≥ 65%**	---	---	---
☒ **35-64%**	---	.6M	---
☐ **< 35%**	---	---	---

Comments: AA is subject to surface water flows during runoff in UT-Big Porcupine Creek.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☒ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☒ **L**	---	M	---
☐ **NA**	---	---	---

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

A	☒ **Vegetated Component >5 acres**						☐ **Vegetated Component 1-5 acres**						☐ **Vegetated Component <1 acre**					
B	☐ **High**		☒ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**	
C	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
P/P	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	.7M	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Forsyth NW - West

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☒ **YES**, add 0.1 to score in **ii** = .8H ☐ **NO**

iv. Final Score and Rating: .8H **Comments:** Upland buffer between northern boundary of AA and highway greater than 50ft.

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and ii below.

i. Discharge Indicators
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☐ Vegetation growing during dormant season/drought.
- ☐ Wetland occurs at the toe of a natural slope.
- ☐ Seeps are present at the wetland edge.
- ☐ AA permanently flooded during drought periods.
- ☐ Wetland contains an outlet, but no inlet.
- ☒ Shallow water table and the site is saturated to the surface.
- ☐ Other: _____

ii. Recharge Indicators
- ☐ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

iii. Rating: Use the information from i and ii above and the table below to select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☐ P/P	☒ S/I	☐ T	☐ None
☒ **Groundwater Discharge or Recharge**	---	.7M	---	---
☐ **Insufficient Data/Information**	---			

Comments: Site hydrology is combination of seasonally high groundwater table and runoff.

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland OR plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types AND structural diversity (#13) is high OR contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types OR associations AND structural diversity (#13) is low-moderate		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant
☐ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☐ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☒ **High Disturbance** at AA (#12i)	---	---	---	---	.4M	---	---	---	---

Comments: AA with several mature trees and is managed in a natural state.

14L. RECREATION / EDUCATION POTENTIAL ☐ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☒ **YES**, go to ii. ☐ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☐ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational ☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	---	.15H
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: Property owned by MDT.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Forsyth NW - West

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	5.3	*
C. General Wildlife Habitat	mod 0.70	1.00	4.1	*
D. General Fish Habitat	low 0.30	1.00	1.8	
E. Flood Attenuation	mod 0.60	1.00	3.5	
F. Short and Long Term Surface Water Storage	high 0.90	1.00	5.3	*
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	5.9	*
H. Sediment / Shoreline Stabilization	mod 0.60	1.00	3.5	
I. Production Export / Food Chain Support	high 0.80	1.00	4.7	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	4.1	*
K. Uniqueness	mod 0.40	1.00	2.4	
L. Recreation / Education Potential (bonus point)	high 0.15		0.9	
Total Points	**7.05**	**11**	**41.5 Total Functional Units**	
Percent of Possible Score 64% (round to nearest whole number)				

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

☒ **Category III Wetland:** (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

RESPEC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Forsyth NW - Middle** Project Number: _____
Assessment Date: **July 24, 2017** Person(s) conducting the assessment: **Bacon/Hoschouer**
Location: **~8 miles NW of Forsyth** MDT District: **Glendive**
Milepost: **~262 on US 12**
Legal Description: T **7N** R **39E** Section **33**
Weather Conditions: **Warm and sunny** Time of Day: **1245-1400**
Initial Evaluation Date: **August 15, 2013** Monitoring Year: **5** # Visits in Year: **1**
Size of evaluation area: **1.8 acres** Land use surrounding wetland: **Ag, grazing, US Hwy 12**

HYDROLOGY

Surface Water Source: **Precipitation, runoff, shallow groundwater**
Inundation: **Absent** Average Depth: **0 feet** Range of Depths: **0**
Percent of assessment area under inundation: **0%**
Depth at emergent vegetation-open water boundary: **0 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **No**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
Geomorphic position, surface soil cracks

Groundwater Monitoring Wells: **Absent**
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:
☒ Map emergent vegetation-open water boundary on aerial photograph.
☒ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☐ Use GPS to survey groundwater monitoring well locations, if present.

COMMENTS / PROBLEMS:
Soil not saturated during late-July survey but soil cracking noticed in areas saturated earlier in growing season.

VEGETATION COMMUNITIES

Community Number: **3** Community Title (main spp): **Pascopyrum smithii / Elymus canadensis**

Dominant Species	% Cover	Dominant Species	% Cover
Bare Ground	+ = < 1%	Symphoricarpos albus	1 = 1-5%
Bromus arvensis	+ = < 1%	Lactuca serriola	1 = 1-5%
Cirsium arvense	1 = 1-5%	Linum lewisii	1 = 1-5%
Elymus canadensis	1 = 1-5%	Pascopyrum smithii	4 = 21-50%
Populus deltoides	2 = 6-10%	Rumex crispus	1 = 1-5%
Sarcobatus vermiculatus	1 = 1-5%	Thlaspi arvense	1 = 1-5%

Comments / Problems: **Elymus trachycaulus-2; Bromus inermis-1; Grindelia squarrosa-1**

Community Number: **4** Community Title (main spp): **Puccinellia nuttalliana / Hordeum jubatum**

Dominant Species	% Cover	Dominant Species	% Cover
Bare ground	2 = 6-10%	Populus deltoides	+ = < 1%
Bromus arvensis	1 = 1-5%	Hordeum jubatum	2 = 6-10%
ELymus repens	1 = 1-5%	Puccinellia nuttalliana	3 = 11-20%
Pascopyrum smithii	2 = 6-10%	Schedonorus pratensis	2 = 6-10%
Rumex crispus	2 = 6-10%	Schoenoplectus maritimus	1 = 1-5%
Eleocharis palustris	2 = 6-10%	Salix lutea	1 = 1-5%

Comments / Problems: **Alopecurus arundinaceus-1; Poa pratensis-1; Muhlenbergia asperifolia <1**

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes

Comments / Problems: **No planted woody vegetation.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - Middle** Date: **July 24, 2017** Examiner: **Lynn Bacon**
Transect Number: **1** Approximate Transect Length: **50 feet** Compass Direction from Start: **205˚** Note: _____

Transect Interval Length: **14 feet (station 0-14)**
Vegetation Community Type: 3 - Pascopyrum smithii / Elymus canadensis

Plant Species	Cover
Bassia scoparia	1 = 1-5%
Pascopyrum smithii	2 = 6-10%
Schedonorus pratensis	1 = 1-5%
Lepidium perfoliatum	1 = 1-5%
Bare Ground	4 = 21-50%
Muhlenbergia asperifolia	1 = 1-5%
Bromus tectorum	4 = 21-50%
Chenopodium album	3 = 11-20%
Total Vegetative Cover:	60%

Transect Interval Length: **19 feet (station 14-33)**
Vegetation Community Type: 4 - Puccinellia nuttalliana / Hordeum jubatum

Plant Species	Cover
Bare Ground	4 = 21-50%
Hordeum jubatum	1 = 1-5%
Puccinellia nuttalliana	2 = 6-10%
Elymus repens	4 = 21-50%
Schedonorus pratensis	4 = 21-50%
Eleocharis palustris	2 = 6-10%
Total Vegetative Cover:	90%

Transect Interval Length: **17 feet (station 33-50)**
Vegetation Community Type: 3 - Pascopyrum smithii / Elymus canadensis

Plant Species	Cover
Bare Ground	1 = 1-5%
Elymus canadensis	+ = < 1%
Ratibida columnifera	1 = 1-5%
Linum lewisii	1 = 1-5%
Schedonorus pratensis	2 = 6-10%
Elymus trachycaulus	4 = 21-50%
Pascopyrum smithii	1 = 1-5%
Symphoricarpos albus	1 = 1-5%
Populus deltoides	4 = 21-50%
Poa pratensis	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length:
Vegetation Community Type:

Plant Species	Cover
Total Vegetative Cover:	%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		Indicator Class	Source
+ = < 1%	3 = 11-10%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = > 50%	0 = Facultative	

Percent of perimeter developing wetland vegetation (excluding dam/berm structures): **100%**

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 foot depth (in open water), or at the point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 foot wide "belt" along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

Comments: **PUCNUT/HORJUB_CT along transect exhibits a micro-'belt' of dominant upland cover; in general wetland area has a dominant hydrophytic community.**

PHOTOGRAPHS

Take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph Checklist:

- ☒ One photograph for each of the four cardinal directions surrounding the wetland.
- ☒ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.
- ☒ At least one photograph showing the buffer surrounding the wetland.
- ☒ One photograph from each end of the vegetation transect, showing the transect.

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1: 46.322174 / -106.840996	300
PP-2		Photo Point 2: 46.323803 / -106.844337	120
T-1 start		Transect 1 start: 46.322948 / -106.842323	205
T-1 end		Transect 1 end: 46.322754 / -106.842438	25
DP-1W		Wetland soil pit: 46.322942 / -106.842481	
DP-1U		Upland soil pit: 46.322911 / -106.842492	
		W & E along road buffer	

Comments / Problems: _____

GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points set at a 5 second recording rate. Record file numbers for site in designated GPS field notebook.

GPS Checklist:

- ☒ Upland/wetland boundary.
- ☒ 4-6 landmarks that are recognizable on the aerial photograph.
- ☒ Start and End points of vegetation transect(s).
- ☒ Photograph reference points.
- ☐ Groundwater monitoring well locations.
- ☐ Bird nest boxes.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual and regional supplement.
- ☒ Delineate wetland – upland boundary onto aerial photograph.

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

- ☒ Complete and attach full MDT Montana Wetland Assessment Method field forms.

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **NA**
If yes, do they need to be repaired? **NA**
If yes, describe the problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: _____

WILDLIFE

Birds

Were man-made nesting structures installed? **No**
If yes, type of structure: _____ How many? **0**
Are the nesting structures being used? **NA**
Do the nesting structures need repairs? **No**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: _____

BIRD SURVEY – FIELD DATA SHEET

Site: **Forsyth NW - Middle** Date: **7/24/17**
Survey Time: _____ to _____

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat

BEHAVIOR CODES
BP = One of a breeding pair
BD = Breeding display
F = Foraging
FO = Flyover
L = Loafing
N = Nesting

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **100 degrees, sunny, mid-afternoon = no bird sightings**

Notes: _____

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Middle City/County: Rosebud Sampling Date: 7/24/17

Applicant/Owner: MDT State: MT Sampling Point: DP-1u

Investigator(s): L. Bacon C. Hoschouer Section, Township, Range: S33 T7N R39E

Landform (hillside, terrace, etc.): slope Local relief (concave, convex, none): convex Slope (%): 5

Subregion (LRR): LRR G Lat: 46.322911 Long: -106.842492 Datum: WGS84

Soil Map Unit Name: Harlem silty clay, 00-2% slopes, occ. Flooded NWI classification: Not Mapped

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
DP on slope above depression where no positive hydrology indicators are evident to date.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. *Populus deltoides*	1	No	FAC
2.			
3.			
4.			
5.			
	1 =Total Cover		
Herb Stratum (Plot size: ____)			
1. *Elymus trachycaulus*	70	Yes	FACU
2. *Schedonorus pratensis*	20	Yes	FACU
3. *Elymus lanceolatus*	5	No	FACU
4. *Ratibida columnifera*	1	No	UPL
5.			
6.			
7.			
8.			
9.			
10.			
	96 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	1	x 3 =	3
FACU species	95	x 4 =	380
UPL species	1	x 5 =	5
Column Totals:	97 (A)		388 (B)
Prevalence Index = B/A =			4.00

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:
Well vegetated upland buffer.

SOIL

Sampling Point: DP-1u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 3/2	100					Loamy/Clayey	
2-16	2.5Y 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No primary or secondary hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No evidence of primary or secondary indicators.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Middle City/County: Rosebud Sampling Date: 7/24/17

Applicant/Owner: MDT State: MT Sampling Point: DP-1w

Investigator(s): L. Bacon, C. Hoschouer Section, Township, Range: S33 T7N R39E

Landform (hillside, terrace, etc.): slope Local relief (concave, convex, none): convex Slope (%): 5

Subregion (LRR): LRR G Lat: 46.322942 Long: -106.842481 Datum: WGS84

Soil Map Unit Name: Harlem silty clay, 00-2% slopes, occ. Flooded NWI classification: Not Mapped

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____

Hydric Soil Present? Yes X No ____

Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
Middle Forsyth wetland developing well, entire depression qualfies as wetland. At this DP soil not not exhibiting redox or other hydric indicators, but qualifies as 'other' given strong secondary hydrology indicators. In 2016, the DP was placed in an area of redox; likely indicators are developing more rapidly in some areas than others.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.	1	No	
2.			
3.			
4.			
5.			
	1 =Total Cover		
Herb Stratum (Plot size: ____)			
1. *Puccinellia nuttalliana*	30	Yes	OBL
2. *Elymus repens*	30	Yes	FACU
3. *Hordeum jubatum*	30	Yes	FACW
4. *Schedonorus pratensis*	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	95 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals:	95 (A)		230 (B)
Prevalence Index = B/A =			2.42

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:
Hydrophytic vegetation dominant in depression.

SOIL

Sampling Point: DP-1w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 3/2	100					Loamy/Clayey	
2-14	2.5Y 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ? Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soils at this pit currently lacks redox features because the wetland is in the early stages of development. Given soil cracks it is evident that the depression saturates for extended periods during the growing season and hydric soil indicators will develop over time.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Positive secondary indicators.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Forsyth NW - Middle **2. MDT Project #:** STPP 14-6(9)259 **3. Control #:** 4059

3. Evaluation Date: 7/24/17 **4. Evaluator(s):** Lynn Bacon **5. Wetland/Site #(s):** Forsyth NW - Middle

6. Wetland Location(s): Township 7 N, Range 39 E, Section 33; Township 7 N, Range 39 E, Section 34

Approximate Stationing or Roadposts: ~262 on US 12

Watershed: 14 - Middle Yellowstone **County:** Rosebud

7. Evaluating Agency: RESPEC for MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
0.58 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 0.58 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	100

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
abundant

12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	---	---	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** AA vegetation recovering from construction disturbance.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: All noxious weeds have decreased: Convolvulus arvensis, Cirsium arvense, Tamarix ramosissima

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA very similar to Forsyth NW - East, only smaller. AA includes a linear, excavated roadside depression parallel to US 12. Surrounding land includes agriculture (grazing) and highway.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Emergent veg class present. Several cottonwood seedlings present in herbaceous layer.

Wetland/Site #(s): Forsyth NW - Middle

14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	---	0L

Sources for documented use (e.g. observations, records): USF&WS T&E list for Rosebud County

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☒ D ☐ S Scarlet Ammannia - Ammannia robusta (S2)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☒ S Great Blue Heron (S3)
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	.9H	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): MTNHP SOC report for T7N R39E, direct observation of Ammannia in 2013.

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☒ ***Minimal:*** Based on any of the following [check].
- ☒ few or no wildlife observations during peak use periods
- ☒ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☐ ***Moderate:*** Based on any of the following [check].
- ☐ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☐ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

Structural Diversity (see #13)	☐ High				☒ Moderate								☐ Low			
Class Cover Distribution (all vegetated classes)	☐ Even				☐ Uneven				☒ Even				☐ Uneven				☐ Even			
Duration of Surface Water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
☐ **Low Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	Wildlife Habitat Features Rating (ii)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
☐ Substantial	---	---	---	---
☐ Moderate	---	---	---	---
☒ Minimal	---	.4M	---	---

Comments: Very few signs of wildlife observed during field survey. This area is close to the roadway and will likely never achieve a high wildlife habitat rating.

Wetland/Site #(s): Forsyth NW - Middle

14D. GENERAL FISH HABITAT ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface Water in AA	☐ **Permanent / Perennial**						☐ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

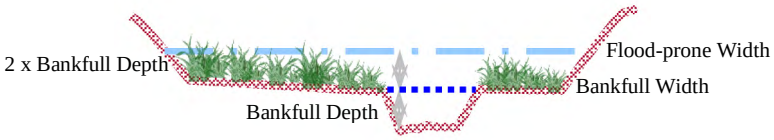
iii. Final Score and Rating: _ **Comments:** _____

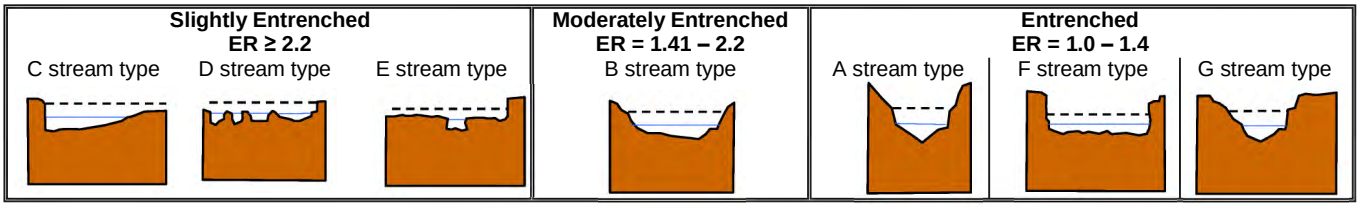
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	☐ Slightly Entrenched C, D, E stream types			☐ Moderately Entrenched B stream type			☐ Entrenched A, F, G stream types		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** AA not subject to flooding from Big Porcupine Creek.

Wetland/Site #(s): Forsyth NW - Middle

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual for further definitions of these terms].

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☐ **>5 acre feet**			☒ **1.1 to 5 acre feet**			☐ **≤1 acre foot**		
Duration of Surface Water at Wetlands within the AA	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☒ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	---	---	---	---	.6M	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: AA subject to pond from precipitation and upland surface flow, capacity to pond at depth >2.2ft.

14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☐ **Yes**	☒ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	---	.8H	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: AA more than 70% vegetated after two years of mitigation site construction.

14H. SEDIMENT / SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of ≥6 (see Appendix F).	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☐ **Permanent / Perennial**	☒ **Seasonal / Intermittent**	☐ **Temporary / Ephemeral**
☐ **≥ 65%**	---	---	---
☒ **35-64%**	---	.6M	---
☐ **< 35%**	---	---	---

Comments: In 2015, observed increased percent cover by wetland species with stability ratings greater than or equal to six.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☒ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☒ **NA**	---	M	---

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

A	☐ **Vegetated Component >5 acres**						☒ **Vegetated Component 1-5 acres**						☐ **Vegetated Component <1 acre**					
B	☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☒ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**	
C	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
P/P	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	.3L	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Forsyth NW - Middle

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☐ **YES**, add 0.1 to score in **ii** = ___ ☒ **NO**

iv. Final Score and Rating: .3L **Comments:**

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and ii below.

i. Discharge Indicators
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☐ Vegetation growing during dormant season/drought.
- ☐ Wetland occurs at the toe of a natural slope.
- ☐ Seeps are present at the wetland edge.
- ☐ AA permanently flooded during drought periods.
- ☐ Wetland contains an outlet, but no inlet.
- ☐ Shallow water table and the site is saturated to the surface.
- ☐ Other: _____

ii. Recharge Indicators
- ☐ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

iii. Rating: Use the information from i and ii above and the table below to select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☐ P/P	☐ S/I	☐ T	☐ None
☐ **Groundwater Discharge or Recharge**	---	---	---	---
☒ **Insufficient Data/Information**	NA			

Comments: AA w/out permeable substrate, holds surface water eventually lost to evaporation.

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☒ Abundant
☐ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	.2L
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: Habitat within AA typical of roadside ditch.

14L. RECREATION / EDUCATION POTENTIAL ☒ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☐ **YES**, go to ii. ☒ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☐ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational ☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: AA small, adjacent to highway, and with little to no recreation or education potential.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Forsyth NW - Middle

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	0.5	*
C. General Wildlife Habitat	mod 0.40	1.00	0.2	
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	NA	1.00	0	
F. Short and Long Term Surface Water Storage	mod 0.60	1.00	0.3	*
G. Sediment / Nutrient / Toxicant Removal	high 0.80	1.00	0.5	*
H. Sediment / Shoreline Stabilization	mod 0.60	1.00	0.3	*
I. Production Export / Food Chain Support	low 0.30	1.00	0.1	
J. Groundwater Discharge / Recharge	NA	NA	0	
K. Uniqueness	low 0.20	1.00	0.1	
L. Recreation / Education Potential (bonus point)	NA		0	
Total Points	**3.8**	**9**	**2.0 Total Functional Units**	
Percent of Possible Score 42% (round to nearest whole number)				

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

☒ **Category III Wetland:** (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

RESPEC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Forsyth NW - East** Project Number: _____
Assessment Date: **July 24, 2017** Person(s) conducting the assessment: **Bacon/Hoschouer**
Location: **~8 miles NW of Forsyth** MDT District: **Glendive**
Milepost: **~262.3 on US 12**
Legal Description: T **7N** R **39E** Section **34**
Weather Conditions: **Hot and sunny, very light breeze** Time of Day: **1400-1500**
Initial Evaluation Date: **August 15, 2013** Monitoring Year: **5** # Visits in Year: **1**
Size of evaluation area: **2.74 acres** Land use surrounding wetland: **Ag., US Highway 12**

HYDROLOGY

Surface Water Source: **Precipitation, runoff, shallow groundwater**
Inundation: **Absent** Average Depth: **0 feet** Range of Depths: **0**
Percent of assessment area under inundation: **0%**
Depth at emergent vegetation-open water boundary: **0 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **No**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
geomorphic position, surface soil cracks

Groundwater Monitoring Wells: **Absent**
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:
☐ Map emergent vegetation-open water boundary on aerial photograph.
☐ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☐ Use GPS to survey groundwater monitoring well locations, if present.

COMMENTS / PROBLEMS:
Site dry on day of investigation.

VEGETATION COMMUNITIES

Community Number: **2** Community Title (main spp): **Rumex crispus/Eleopcharis palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	4 = 21-50%	Taraxacum officinalis	1 = 1-5%
Bare Ground	2 = 6-10%	Broumus arvensis	1 = 1-5%
Alopecurus pratensis	1 = 1-5%	Pascopyrum smithii	2 = 6-10%
Hordeum jubatum	1 = 1-5%	Rumex crispus	1 = 1-5%
Poa pratensis	1 = 1-5%	Tragopogon dubius	1 = 1-5%
Schoenoplectus maritimus	1 = 1-5%	Elymus repens	1 = 1-5%

Comments / Problems: **Tamarix ramosissima (<1); Convolvulus arvensis (<1)**

Community Number: **3** Community Title (main spp): **Pascopyrum smithii / Elymus spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Pascopyrum smithii	5 = > 50%	Ambrosia psilostachya	1 = 1-5%
Elymus canadensis	1 = 1-5%	Bare Ground	1 = 1-5%
Elymus trachycaulus	3 = 11-20%	Chenopodium album	1 = 1-5%
Bromus arvensis	1 = 1-5%	Elymus repens	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%	Lactuca serriola	1 = 1-5%
Agropyron cristatum	1 = 1-5%	Linum lewisii	1 = 1-5%

Comments / Problems: _____

Community Number: **4** Community Title (main spp): **Hordeum jubatum/Eleocharis palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	4 = 21-50%	Populus deltoides	+ = < 1%
Bare Ground	1 = 1-5%	Salix fragilis	+ = < 1%
Alopecurus pratensis	2 = 6-10%	Pascopyrum smithii	2 = 6-10%
Hordeum jubatum	2 = 6-10%	Rumex crispus	+ = < 1%
Poa pratensis	1 = 1-5%	Tragopogon dubius	+ = < 1%
Schoenoplectus maritimus	2 = 6-10%	Elymus repens	1 = 1-5%

Comments / Problems: **Tamarix ramosissima (<1); Convolvulus arvensis (<1)**

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes

Comments / Problems: **No planted woody vegetation.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - East** Date: **July 24, 2017** Examiner: **Lynn Bacon**
Transect Number: **1** Approximate Transect Length: **125 feet** Compass Direction from Start: **145˚** Note: _____

Transect Interval Length: **32 feet (station 0-32)**
Vegetation Community Type: Pascopyrum smithii/Elymus spp.

Plant Species	Cover
Mud Flats	2 = 6-10%
Lactuca serriola	+ = < 1%
Pascopyrum smithii	5 = > 50%
Bromus tectorum	4 = 21-50%
Melilotus officinale	1 = 1-5%
Helianthus annus	+ = < 1%
Populus deltoides	+ = < 1%
Mulhlenbergia asperifolia	+ = < 1%
Total Vegetative Cover:	90%

Transect Interval Length: **63 feet (station 32-95)**
Vegetation Community Type: Hordeum jubatum/Eleocharis palustris

Plant Species	Cover
Eleocharis palustris	5 = > 50%
Alopecurus arundinaceus	3 = 11-20%
Elymus repens	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Schoenoplectus maritimus	1 = 1-5%
Tamarix ramosissima	1 = 1-5%
bare ground	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **30 feet (station 95-125)**
Vegetation Community Type: Pascopyrum smithii/Elymus spp

Plant Species	Cover
Elymus trachycaulus	1 = 1-5%
Pascopyrum smithii	5 = > 50%
Linum lewisii	1 = 1-5%
Chenopodium album	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%
Bromus tectorum	4 = 21-50%
Poa compressa	1 = 1-5%
Total Vegetative Cover:	100%

Transect Interval Length:
Vegetation Community Type:

Plant Species	Cover
Total Vegetative Cover:	%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - East** Date: **July 24, 2017** Examiner: **Lynn Bacon**
Transect Number: **2** Approximate Transect Length: **181 feet** Compass Direction from Start: **280˚** Note: _____

Transect Interval Length: **30 feet (station 0-30)**	
Vegetation Community Type: Pascopyrum smithii / Elymus spp.	
Plant Species	**Cover**
Elymus tracycaulus	4 = 21-50%
Melilotus officinales	3 = 11-20%
Bare Ground	1 = 1-5%
Hordeum jubatum	2 = 6-10%
Pascopyrum smithii	4 = 21-50%
Total Vegetative Cover:	95%

Transect Interval Length: **100 feet (station 30-130)**	
Vegetation Community Type: Rumex crispus / Eleopcharis palustris feet	
Plant Species	**Cover**
Eleocharis palustris	4 = 21-50%
Schedonorus pratensis	4 = 21-50%
Helianthus annus	1 = 1-5%
Poa compressa	1 = 1-5%
Bare ground	1 = 1-5%
Hordeum jubatum	4 = 21-50%
Pascopyrum smithii	1 = 1-5%
Salix fragilis	1 = 1-5%
Total Vegetative Cover:	98%

Transect Interval Length: **51 feet (station 130-181)**	
Vegetation Community Type: Pascopyrum smithii / Elymus spp.	
Plant Species	**Cover**
Pascopyrum smithii	5 = > 50%
Rumex crispus	1 = 1-5%
Linum lewisii	1 = 1-5%
Bare Ground	1 = 1-5%
Lepidium perfoliatum	1 = 1-5%
Total Vegetative Cover:	98%

Transect Interval Length:	
Vegetation Community Type:	
Plant Species	**Cover**
Total Vegetative Cover:	%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		Indicator Class	Source
+ = < 1%	3 = 11-10%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = > 50%	0 = Facultative	

Percent of perimeter developing wetland vegetation (excluding dam/berm structures): **16%**

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 foot depth (in open water), or at the point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 foot wide "belt" along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

Comments: **Of 2.74 acre perimeter, approximately 0.4 acre is wetland or ~ 16%: middle section (84%) has not converted to wetland.**

PHOTOGRAPHS

Take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph Checklist:

- ☐ One photograph for each of the four cardinal directions surrounding the wetland.
- ☐ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.
- ☐ At least one photograph showing the buffer surrounding the wetland.
- ☐ One photograph from each end of the vegetation transect, showing the transect.

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1: 46.321003 / -106.838814	125
PP-2		Photo Point 2: 46.320068 / -106.837128	210
PP-3		Photo Point 3: 46.318233 / -106.834335	305
T-1 start		Transect 1 start: 46.321045 / -106.838486	145
T-1 end		Transect 1 end: 46.320297 / -106.838493	325
T-2 start		Transect 2 start: 46.318336 / -106.834175	280
T-2 end		Transect 2 end: 46.318417 / -106.834923	100
DP-1W		Wetland soil pit: 46.320943 / -106.838674	
DP-1U		Upland soil pit #1: 46.320920 / -106.838707	
DP-2U		Upland soil pit #2: 46.319610 / -106.835927	

Comments / Problems: _____

GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points set at a 5 second recording rate. Record file numbers for site in designated GPS field notebook.

GPS Checklist:

- ☒ Upland/wetland boundary.
- ☒ 4-6 landmarks that are recognizable on the aerial photograph.
- ☒ Start and End points of vegetation transect(s).
- ☒ Photograph reference points.
- ☐ Groundwater monitoring well locations.
- ☐ Bird nest boxes.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual and regional supplement.
- ☒ Delineate wetland – upland boundary onto aerial photograph.

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

- ☒ Complete and attach full MDT Montana Wetland Assessment Method field forms.

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **No**
If yes, do they need to be repaired? **NA**
If yes, describe the problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? **No**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: **Middle section of project area remains upland.**

WILDLIFE

Birds

Were man-made nesting structures installed? **No**
If yes, type of structure: _____ How many? **0**
Are the nesting structures being used? **NA**
Do the nesting structures need repairs? **No**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
none observed		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: _____

BIRD SURVEY – FIELD DATA SHEET

Site: **Forsyth NW - East** Date: **7/24/17**
Survey Time: **1330** to **1500**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Robin	1	F	UP				

BEHAVIOR CODES
BP = One of a breeding pair
BD = Breeding display
F = Foraging
FO = Flyover
L = Loafing
N = Nesting

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **sunny, 95-100 degrees, mid-afternoon = minimal bird sightings**

Notes: _____

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - East | City/County: Rosebud | Sampling Date: 7/24/17

Applicant/Owner: MDT | State: MT | Sampling Point: DP-1u

Investigator(s): L. Bacon, C. Hoschouer | Section, Township, Range: S34 T7N R39E

Landform (hillside, terrace, etc.): slope | Local relief (concave, convex, none): convex | Slope (%): 5

Subregion (LRR): LRR G | Lat: 46.320920 | Long: -106.838707 | Datum: WGS84

Soil Map Unit Name: Harlem silty clay, 00-2% slopes, occ. Flooded | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland data point. To date,wetland vegetation is not colonizing lower area of bank slope.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: ____)			
1. *Pascopyrum smithii*	65	Yes	FACU
2. *Elymus trachycaulus*	25	Yes	FACU
3. *Muhlenbergia asperifolia*	1	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	91 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	1	x 2 =	2
FAC species	0	x 3 =	0
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	91 (A)		362 (B)

Prevalence Index = B/A = 3.98

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:
Slopes dry, some bare ground occurs in patches.

SOIL

Sampling Point: DP-1u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	2.5Y 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No evidence of primary or secondary indicators.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - East City/County: Rosebud Sampling Date: 7/24/17

Applicant/Owner: MDT State: MT Sampling Point: DP-1w

Investigator(s): L. Bacon, C. Hoschouer Section, Township, Range: S34 T7N R39E

Landform (hillside, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): LRR G Lat: 46.320943 Long: -106.838674 Datum: WGS84

Soil Map Unit Name: Harlem silty clay, 0-2% slopes, occ. Flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____

Hydric Soil Present? Yes X No ____

Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
Wetland data point. North and south end of project area continue to qualify as wetland; no boundary change since 2016.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____	=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____	=Total Cover	
Herb Stratum (Plot size: ____)			
1. *Eleocharis palustris*	90	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____	=Total Cover	

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		90 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:
Same percentages as 2016 at this different DP location.

SOIL

Sampling Point: DP-1w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	2.5YR 3/2	90	2.5Y 4/4	10	C	PL	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ? Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ? Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ? Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Prominent redox concentrations noted.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- x Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Late in a very hot and drought-declared area. Positive secondary indicators evident, however.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - East City/County: Rosebud Sampling Date: 7/24/17

Applicant/Owner: MDT State: MT Sampling Point: DP-2u

Investigator(s): L. Bacon, C. Hoschouer Section, Township, Range: S34 T7N R39E

Landform (hillside, terrace, etc.): slope Local relief (concave, convex, none): convex Slope (%): 5

Subregion (LRR): LRR G Lat: 46.319610 Long: -106.835927 Datum: WGS84

Soil Map Unit Name: Harlem silty clay, 00-2% slopes, occ. Flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland data point. Approximately 25% of the bottom of the swale has converted to wetland; the central 50% remains upland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: ____)			
1. *Pascopyrum smithii*	95	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	95	x 4 =	380
UPL species	0	x 5 =	0
Column Totals:	95 (A)		380 (B)
Prevalence Index = B/A =			4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:
Pit located in bottom of excavated area, dominant upland vegetation.

SOIL

Sampling Point: DP-2u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	2.5Y 3/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil in this central area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- x Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No evidence of primary or secondary indicators.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Forsyth NW - East **2. MDT Project #:** STPP 14-6(9)259 **3. Control #:** 4059

3. Evaluation Date: 7/24/17 **4. Evaluator(s):** LBacon **5. Wetland/Site #(s):** Forsyth NW - East

6. Wetland Location(s): Township 7 N, Range 39 E, Section 34; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: ~262.3 on US 12

Watershed: 14 - Middle Yellowstone **County:** _ Rosebud _ _____

7. Evaluating Agency: Confluence for MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
0.43 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 0.43 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	100

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
abundant

12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	---	---	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** AA vegetation cover has increased since 2013, following construction of wetland basin, bare ground <5%. Center of basin, area intended to convert to wetland, continues to qualify as upland.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Convolvulus arvensis, Tamarix ramosissima (both have decreased since 2016)

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA includes a linear, excavated roadside depression parallel to US 12. Surrounding land includes agriculture (grazing) and highway.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Emergent vegetation class present, with several cottonwood maturing saplings though does not qualify as PSS yet.

Wetland/Site #(s): Forsyth NW - East

14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	---	0L

Sources for documented use (e.g. observations, records): USF&WS T&E list for Rosebud County

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☒ D ☐ S Scarlet Ammannia - Ammannia robusta (S2), Western Hog-nosed Snake
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☒ S Great Blue Heron (S3)
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	.9H	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): MTNHP SOC report for T7N R39E, direct observation of Ammannia in 2013.

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☒ ***Minimal:*** Based on any of the following [check].
- ☒ few or no wildlife observations during peak use periods
- ☒ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☐ ***Moderate:*** Based on any of the following [check].
- ☐ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☐ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

Structural Diversity (see #13)	☐ High				☒ Moderate								☐ Low			
Class Cover Distribution (all vegetated classes)	☐ Even				☐ Uneven				☒ Even				☐ Uneven				☐ Even			
Duration of Surface Water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
☐ **Low Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	Wildlife Habitat Features Rating (ii)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
☐ Substantial	---	---	---	---
☐ Moderate	---	---	---	---
☒ Minimal	---	.4M	---	---

Comments: Mid-summer, mid-afternoon survey likely reduced wildlife sightings at this site. Will survey in June 2018 (construction of West site prevented earlier site assessment).

Wetland/Site #(s): Forsyth NW - East

14D. GENERAL FISH HABITAT ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface Water in AA	☐ **Permanent / Perennial**						☐ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

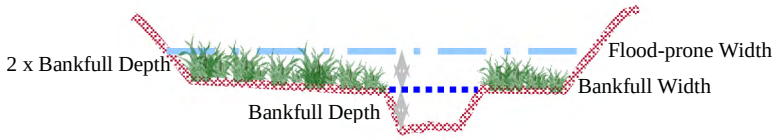
iii. Final Score and Rating: _ **Comments:** _____

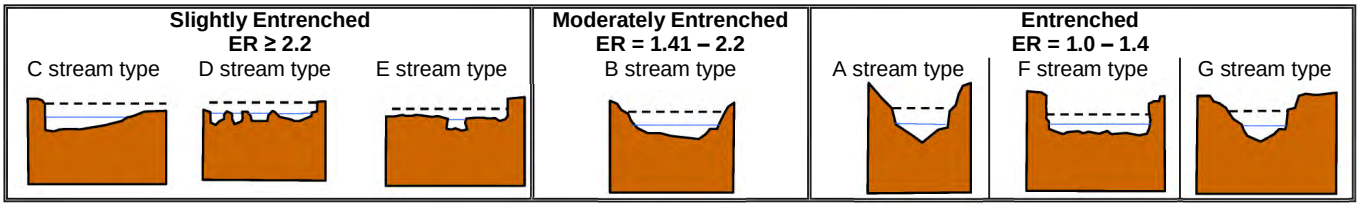
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	☐ Slightly Entrenched C, D, E stream types			☐ Moderately Entrenched B stream type			☐ Entrenched A, F, G stream types		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** AA not subject to flooding from Big Porcupine Creek.

Wetland/Site #(s): Forsyth NW - East

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual for further definitions of these terms].

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☐ **>5 acre feet**			☐ **1.1 to 5 acre feet**			☒ **≤1 acre foot**		
Duration of Surface Water at Wetlands within the AA	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☒ **S/I**	☐ **T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	---	---	---	---	---	---	---	.3L	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: AA subject to pond from precipitation and upland surface flow. 2017 drought in effect; very little precipitation during summer 2017.

14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	1H	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: AA achieved greater than 70% vegetation cover, with early succession annuals, native perennial, rhizomotous and bunch grasses, and natural Populus deltoides recruitment.

14H. SEDIMENT / SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or **Shoreline by Species with Stability Ratings of ≥6** (see Appendix F).	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☐ **Permanent / Perennial**	☒ **Seasonal / Intermittent**	☐ **Temporary / Ephemeral**
☐ **≥ 65%**	---	---	---
☒ **35-64%**	---	.6M	---
☐ **< 35%**	---	---	---

Comments: AA with seasonal/ephemeral water. Vegetation transitioning from annuals to perennial rhizomatous grasses and bunchgrasses, along with natural Populus deltoides recruitment.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)** ☐ **E/H**	☒ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☒ **NA**	---	M	---

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

A	☐ **Vegetated Component >5 acres**						☐ **Vegetated Component 1-5 acres**						☒ **Vegetated Component <1 acre**					
B	☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☒ **Moderate**		☐ **Low**	
C	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
P/P	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.3L	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Forsyth NW - East

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☐ **YES**, add 0.1 to score in **ii** = ___ ☒ **NO**

iv. Final Score and Rating: .3L **Comments:**

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and ii below.

i. Discharge Indicators
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☐ Vegetation growing during dormant season/drought.
- ☐ Wetland occurs at the toe of a natural slope.
- ☐ Seeps are present at the wetland edge.
- ☐ AA permanently flooded during drought periods.
- ☐ Wetland contains an outlet, but no inlet.
- ☐ Shallow water table and the site is saturated to the surface.
- ☒ Other: AA hydrologically connected to a historic oxbow.

ii. Recharge Indicators
- ☐ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

iii. Rating: Use the information from i and ii above and the table below to select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☐ **P/P**	☒ **S/I**	☐ **T**	☐ **None**
☒ **Groundwater Discharge or Recharge**	---	.7M	---	---
☐ **Insufficient Data/Information**	---			

Comments: Ponding was observed on site in 2014, but not observed in 2015, 2016 or 2017 (mid-summer survey was during proclaimed drought period).

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☒ Abundant
☐ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	.2L
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: AA resembles a roadside ditch.

14L. RECREATION / EDUCATION POTENTIAL ☒ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☐ **YES**, go to ii. ☒ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☐ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational ☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	**Known**	**Potential**
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: AA small, adjacent to highway, and with little to no recreation or education potential.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Forsyth NW - East

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	.387	*
C. General Wildlife Habitat	mod 0.40	1.00	.172	
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	NA	NA	0	
F. Short and Long Term Surface Water Storage	low 0.30	1.00	.129	
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	.43	*
H. Sediment / Shoreline Stabilization	mod 0.60	1.00	.258	*
I. Production Export / Food Chain Support	low 0.30	1.00	.129	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	.301	*
K. Uniqueness	low 0.20	1.00	.086	
L. Recreation / Education Potential (bonus point)	NA		0	
Total Points	**4.4**	**9**	**1.89 Total Functional Units**	
Percent of Possible Score 49% (round to nearest whole number)				

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

☒ **Category III Wetland:** (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Forsyth NW - Treasure Co. Line** Project Number: _____
Assessment Date: **July 24, 2017** Person(s) conducting the assessment: **LBacon/CHoschouer**
Location: **~17 miles west of Forsyth** MDT District: **Glendive**
Milepost: **~RP 81.7 on I-94**
Legal Description: T **6N** R **38E** Section **23**
Weather Conditions: **Warm and sunny** Time of Day: **1530**
Initial Evaluation Date: **August 14, 2013** Monitoring Year: **5** # Visits in Year: **1**
Size of evaluation area: **5.89 acres** Land use surrounding wetland: **I-94, agriculture, grazing**

HYDROLOGY

Surface Water Source: **Groundwater, precipitation**
Inundation: **Present** Average Depth: **0.1 feet** Range of Depths: **0-0.1ft**
Percent of assessment area under inundation: **20*%**
Depth at emergent vegetation-open water boundary: **1 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **Yes**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
Surface water, H2S odor, geomorphic position, salt crust

Groundwater Monitoring Wells: **Absent**
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:
☒ Map emergent vegetation-open water boundary on aerial photograph.
☒ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☐ Use GPS to survey groundwater monitoring well locations, if present.

COMMENTS / PROBLEMS:
***Late mid-summer, drought in progress, 1-2" of water in center of wetland areas, all excavated areas saturated however.**

VEGETATION COMMUNITIES

Community Number: **3** Community Title (main spp): **Schoenoplectus spp. /**

Dominant Species	% Cover	Dominant Species	% Cover
Schoenoplectus pungens	5 = > 50%	Hordeum jubatum	1 = 1-5%
Bare Ground	1 = 1-5%	Lycopus asper	1 = 1-5%
Distichlis spicata	2 = 6-10%	Typha latifolia	1 = 1-5%
Eleocharis palustris	1 = 1-5%	Carex sp.	1 = 1-5%
Schoenoplectus maritimus	1 = 1-5%	Puccinellia nuttalliana	+ = < 1%
Sonchus arvensis	1 = 1-5%	Rumex crispus	+ = < 1%

Comments / Problems: **Mentha arvensis-<1; Sisyrinchium sp. (in wetland, potentially septentrionale)**

Community Number: **4** Community Title (main spp): **Artemisia cana / Bromus arvensis**

Dominant Species	% Cover	Dominant Species	% Cover
Pascopyrum smithii	4 = 21-50%	Bare Ground	1 = 1-5%
Bromus arvensis	3 = 11-20%	Puccinellia nuttalliana	1 = 1-5%
Artemisia cana	3 = 11-20%	Sisymbrium altissimum	1 = 1-5%
Lepidium perfoliatum	3 = 11-20%	Sonchus arvensis	1 = 1-5%
Bassia scoparia	2 = 6-10%	Tragopogon dubius	1 = 1-5%
Agropyron cristatum	1 = 1-5%	Artemisia frigida	1 = 1-5%

Comments / Problems: _____

Community Number: **5** Community Title (main spp): **Pascopyrum smithii / Bromus arvensis**

Dominant Species	% Cover	Dominant Species	% Cover
Pascopyrum smithii	4 = 21-50%	Artemisia cana	1 = 1-5%
Bromus arvensis	3 = 11-20%	Bare Ground	1 = 1-5%
Elymus junceus	2 = 6-10%	Hordeum jubatum	2 = 6-10%
Chenopodium album	2 = 6-10%	Puccinellia nuttalliana	1 = 1-5%
Grindelia squarrosa	1 = 1-5%	Schedonorus pratensis	1 = 1-5%
Lactuca serriola	1 = 1-5%	Sonchus arvensis	1 = 1-5%

Comments / Problems: **Distichlis spicata-2; Cirsium arvense-1; Poa bulbosa-<1; Lepidium perfoliatum-1;**

Community Number: **6** Community Title (main spp): **Artemesia cana/Pascopyrum smithii**

Dominant Species	% Cover	Dominant Species	% Cover
Pascopyrum smithii	5 = > 50%	Bare Ground	1 = 1-5%
Bromus arvensis	2 = 6-10%	Puccinellia nuttalliana	1 = 1-5%
Artemisia cana	3 = 11-20%	Distichlis spicata	1 = 1-5%
Lepidium perfoliatum	3 = 11-20%	Sonchus arvensis	+ = < 1%
Bassia scoparia	1 = 1-5%	Tragopogon dubius	1 = 1-5%
Agropyron cristatum	1 = 1-5%	Artemisia frigida	1 = 1-5%

Comments / Problems: **CT 4 has converted to CT 6 (2017); Muhlenbergia sp.-<1; Elymus repens-1**

VEGETATION COMMUNITIES (continued)

Community Number: **7** Community Title (main spp): **Distichlis spicata/Puccinellia nuttalliana**

Dominant Species	% Cover	Dominant Species	% Cover
Distichlis spicata	4 = 21-50%	Muhlenbergia asperifolia	1 = 1-5%
Puccinellia nuttalliana	2 = 6-10%	Salicornia rubra	1 = 1-5%
Hordeum jubatum	2 = 6-10%	Bassia scoparia	1 = 1-5%
Spergularia rubra	1 = 1-5%		
Bare Greound (dried mud)	4 = 21-50%		
Schedonorus pratensis	1 = 1-5%		

Comments / Problems: _____

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes

Comments / Problems: **No woody vegetation planted at site.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - Treasure Co. Line** Date: **July 24, 2017** Examiner: **Lynn Bacon**
Transect Number: **1** Approximate Transect Length: **534 feet** Compass Direction from Start: **190˚** Note: _____

Transect Interval Length: **4 feet (station 0-4)**	
Vegetation Community Type: 5-Pascopyrum smithii / Bromus arvensis	
Plant Species	**Cover**
Bare Ground	1 = 1-5%
Elymus repens	5 = > 50%
Agropyrum cristatum	1 = 1-5%
Hordeum jubatum	3 = 11-20%
Sonchus arvensis	1 = 1-5%
Bassia scoparia	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length: **53 feet (station 4-57)**	
Vegetation Community Type: 7-Distichlis spicata/Puccinellia nuttalliana	
Plant Species	**Cover**
Bare Ground (dried mud)	4 = 21-50%
Salicornia rubra	1 = 1-5%
Puccinellia nuttalliana	2 = 6-10%
Basia scoparia	1 = 1-5%
Hordeum jubatum	2 = 6-10%
Muhlenbergia asperifolia	1 = 1-5%
Distichlis spicata	4 = 21-50%
Schedonorus pratensis	1 = 1-5%
Spergularia rubra	1 = 1-5%
Total Vegetative Cover:	75%

Transect Interval Length: **37 feet (station 57-94)**	
Vegetation Community Type: 5-Pascopyrum smithii / Bromus arvensis	
Plant Species	**Cover**
Bromus arvensis	4 = 21-50%
Bare Ground	3 = 11-20%
Hordeum jubatum	1 = 1-5%
Schedonorus pratensis	3 = 11-20%
Chenopodium album	2 = 6-10%
Muhlenbergia asperifolia	3 = 11-20%
Sonchus arvensis	+ = < 1%
Carduus nuutans	+ = < 1%
Total Vegetative Cover:	85%

Transect Interval Length: **107 feet (station 94-201)**	
Vegetation Community Type: 3-Schoenoplectus spp.	
Plant Species	**Cover**
Schoenoplectus pungens	5 = > 50%
Typha latifolia	3 = 11-20%
Sonchus arvensis	2 = 6-10%
Elaeagnus angustifolia	+ = < 1%
Total Vegetative Cover:	100%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Forsyth NW - Treasure Co. Line** Date: **July 24, 2017** Examiner: **Lynn Bacon**
Transect Number: **1** Approximate Transect Length: **534 feet** Compass Direction from Start: **190˚** Note: _____

Transect Interval Length: **146 feet (station 201-347)**	
Vegetation Community Type: 5-Pascopyrum smithii / Bromus arvensis	
Plant Species	**Cover**
Pascopyrum smithii	4 = 21-50%
Bromus arvensis	3 = 11-20%
Poa bulbosa	+ = < 1%
Bromus ciliatus	1 = 1-5%
Lipidium perfoliatum	4 = 21-50%
Bare Ground	1 = 1-5%
Chenopodium album	1 = 1-5%
Cirsium arvense	1 = 1-5%
Schoenoplectus pungens	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **63 feet (station 347-410)**	
Vegetation Community Type: 3-Schoenoplectus spp. /	
Plant Species	**Cover**
Schoenoplectus pungens	5 = > 50%
Sonchus arvensis	1 = 1-5%
Total Vegetative Cover:	100%

Transect Interval Length: **124 feet (station 410-534)**	
Vegetation Community Type: 5-Pascopyrum smithii / Bromus arvensis	
Plant Species	**Cover**
Pascopyrum smithii	5 = > 50%
Bromus japonicus	2 = 6-10%
Distichlis spicata	+ = < 1%
Bare Ground	1 = 1-5%
Lipidium perfoliatum	2 = 6-10%
Artemesia cana	1 = 1-5%
Chenopodium album	2 = 6-10%
Sonchus arvensis	+ = < 1%
Hordeum jubatum	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length:	
Vegetation Community Type:	
Plant Species	**Cover**
Total Vegetative Cover:	%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		Indicator Class	Source
+ = < 1%	3 = 11-10%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = > 50%	0 = Facultative	

Percent of perimeter developing wetland vegetation (excluding dam/berm structures): **100%**

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 foot depth (in open water), or at the point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 foot wide "belt" along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

Comments: **Wetland in very good condition, slight acreage growth.**

PHOTOGRAPHS

Take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph Checklist:

- ☐ One photograph for each of the four cardinal directions surrounding the wetland.
- ☐ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.
- ☐ At least one photograph showing the buffer surrounding the wetland.
- ☐ One photograph from each end of the vegetation transect, showing the transect.

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1: 46.261292 / -106.937012	180
PP-2		Photo Point 2: 46.261398 / -106.937569	140
PP-3		Photo Point 3: 46.260593 / -106.937988	45
PP-4		Photo Point 4: 46.260349 / -106.936935	315
T-1 start		Transect 1 start: 46.260059 / -106.937912	10
T-1 end		Transect 1 end: 46.261635 / -106.937218	190
DP-1W		Wetland soil pit: 46.261483 / -106.937079	
DP-1U		Upland soil pit: 46.26144 / -106.937075	

Comments / Problems: _____

GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points set at a 5 second recording rate. Record file numbers for site in designated GPS field notebook.

GPS Checklist:

- ☒ Upland/wetland boundary.
- ☐ 4-6 landmarks that are recognizable on the aerial photograph.
- ☐ Start and End points of vegetation transect(s).
- ☐ Photograph reference points.
- ☐ Groundwater monitoring well locations.
- ☐ Bird nest boxes.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual and regional supplement.
- ☒ Delineate wetland – upland boundary onto aerial photograph.

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

- ☒ Complete and attach full MDT Montana Wetland Assessment Method field forms.

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **NA**
If yes, do they need to be repaired? **NA**
If yes, describe the problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: **Cattle tracks observed in wetland areas.**

WILDLIFE

Birds

Were man-made nesting structures installed? **No**
If yes, type of structure: _____ How many? **0**
Are the nesting structures being used? **NA**
Do the nesting structures need repairs? **NA**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: Late afternoon, 100 degrees

BIRD SURVEY – FIELD DATA SHEET

Site: **Forsyth NW - Treasure Co. Line** Date: **7/24/17**
Survey Time: **1530** to **1730**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat

BEHAVIOR CODES
BP = One of a breeding pair
BD = Breeding display
F = Foraging
FO = Flyover
L = Loafing
N = Nesting

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **100 degress, sunny; no avian identified.**

Notes: _____

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Treasure City/County: Rosebud Sampling Date: 7/24/17

Applicant/Owner: MDT State: MT Sampling Point: DP-1u

Investigator(s): L. Bacon, C. Hoschouer Section, Township, Range: S23 T6N R38E

Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0

Subregion (LRR): LRR G Lat: 46.26144 Long: -106.937075 Datum: WGS84

Soil Map Unit Name: Borollic Camborthids-Ustic Torrifluvents complex, 0-8% slopes NWI classification: Not mapped

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
DP located on elevated terrace above excavated wetland area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: ____)			
1. *Agropyron cristatum*	75	Yes	UPL
2. *Bromus tectorum*	10	No	UPL
3. *Grindelia squarrosa*	5	No	UPL
4. *Lactuca serriola*	5	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	95 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	=Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	90	x 5 =	450
Column Totals:	95 (A)		465 (B)
Prevalence Index = B/A =			4.89

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
DP on raised flat area above excavated wetland area.

SOIL

Sampling Point: DP-1u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Nonhydric soil in this elevated area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary or secondary indicators on this elevated terrace.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Treasure | City/County: Rosebud | Sampling Date: 7/24/17

Applicant/Owner: MDT | State: MT | Sampling Point: DP-1w

Investigator(s): L. Bacon, C. Hoschouer | Section, Township, Range: S23 T6N R38E

Landform (hillside, terrace, etc.): terrace | Local relief (concave, convex, none): convex | Slope (%): 0

Subregion (LRR): LRR G | Lat: 46.261483 | Long: -106.937079 | Datum: WGS84

Soil Map Unit Name: Borollic Camborthids-Ustic Torrifluvents complex, 0-8% slopes | NWI classification: Not mapped

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
DP located in low area. Cattle tracks noted.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____	=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____	=Total Cover	
Herb Stratum (Plot size: ____)			
1. *Hordeum jubatum*	60	Yes	FACW
2. *Distichlis spicata*	20	Yes	FACW
3. *Puccinellia nuttalliana*	10	No	OBL
4. *Sonchus arvensis*	2	No	FAC
5. *Spergularia rubra*	2	No	FACU
6.			
7.			
8.			
9.			
10.			
	94	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____	=Total Cover	

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	80	x 2 =	160
FAC species	2	x 3 =	6
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	94 (A)		184 (B)
Prevalence Index = B/A =			1.96

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:
DP in low area.

SOIL

Sampling Point: DP-1w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					Loamy/Clayey	
2-16	10YR 4/2	85	2.5YR 3/6	15	C	M	Loamy/Clayey	Prominent redox concentrations (actually 5YR 3/6, autoform malfx)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ? Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR I, J)**
- ? Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ? Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydric soil in this low area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Dry mid-summer.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Forsyth NW - Treasure Co. Line **2. MDT Project #:** STPP 14-6(9)259 **3. Control #:** 4059

3. Evaluation Date: 7/24/17 **4. Evaluator(s):** Lynn Bacon **5. Wetland/Site #(s):** Forsyth NW - Treasure Co. Line

6. Wetland Location(s): Township 6 N, Range 38 E, Section 23; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: ~RP 81.7 on I-94

Watershed: 15 - Lower Yellowstone **County:** _ Rosebud _ _____

7. Evaluating Agency: RESPEC for MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other _____**

8. Wetland Size (acre): _____ (visually estimated)
1.74 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 1.74 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Depressional	Emergent Wetland	Excavated	Permanent / Perennial	90
Depressional	Emergent Wetland		Seasonal / Intermittent	10

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
common

12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	---	---	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** Constructed AA with sufficient time for vegetation to establish. Changed from low to moderate disturbance because there was evidence of moderate grazing that occurred earlier in the year within the AA.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA includes excavated wetland constructed adjacent to a larger wetland area. AA also includes depressional PEM wetland outside of excavated constructed wetland, along the northern edge of the project boundary, Surrounding land use includes I-94, agriculture, and grazing.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	mod	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Emergent wetland with scattered shrubs.

Wetland/Site #(s): Forsyth NW - Treasure Co. Line

14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	---	0L

Sources for documented use (e.g. observations, records): USF&WS T&E list for Rosebud County

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S
Secondary habitat (**list species**) ☒ D ☐ S Great Blue Heron (S3)
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	.6M	---	---	---	---

Sources for documented use (e.g. observations, records): GBH observed on site in previous year; 2017 Blue-Eyed-Grass: suspected Northern, will search for more specimens in 2018 (S1S2, only 1 plant, will not document at this time).

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☒ ***Moderate:*** Based on any of the following [check].
- ☒ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☒ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

Structural Diversity (see #13)	☐ High				☒ Moderate				☐ Low			
Class Cover Distribution (all vegetated classes)	☐ Even				☐ Uneven				☒ Even				☐ Uneven				☐ Even			
Duration of Surface Water in ≥ 10% of AA	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**
☐ **Low Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	Wildlife Habitat Features Rating (ii)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
☐ **Substantial**	---	---	---	---
☒ **Moderate**	---	.7M	---	---
☐ **Minimal**	---	---	---	---

Comments: Rating decreased from 2014 due to evidence of recent cattle grazing in AA. 2017: cattle tracks noted.

Wetland/Site #(s): Forsyth NW - Treasure Co. Line

14D. GENERAL FISH HABITAT ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface Water in AA	☐ **Permanent / Perennial**						☐ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☒ **N0**

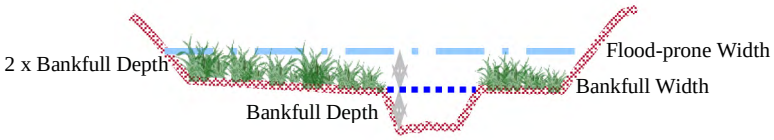
iii. Final Score and Rating: _ **Comments:** _____

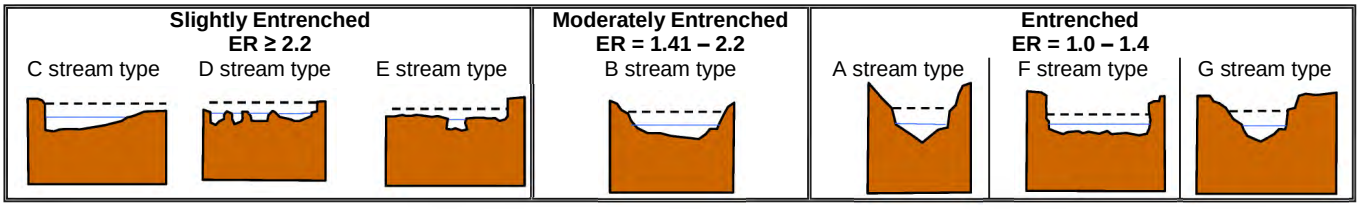
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	☐ Slightly Entrenched C, D, E stream types			☒ Moderately Entrenched B stream type			☐ Entrenched A, F, G stream types		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☒ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	.4M	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** overbank flow potential from nearby drainage feature

Wetland/Site #(s): Forsyth NW - Treasure Co. Line

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual for further definitions of these terms].

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☐ **>5 acre feet**			☒ **1.1 to 5 acre feet**			☐ **≤1 acre foot**		
Duration of Surface Water at Wetlands within the AA	☐ **P/P**	☐ **S/I**	☐ **T/E**	☒ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	---	---	---	.8H	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: Has potential to receive overbank flow.

14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	.9H	---	---	---	---	---	---	---

Comments: grazing and interstate highway nearby but no high levels of sediment, nutrients or toxicants.

14H. SEDIMENT / SHORELINE STABILIZATION ☒ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of ≥6 (see Appendix F).	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☐ **Permanent / Perennial**	☐ **Seasonal / Intermittent**	☐ **Temporary / Ephemeral**
☐ **≥ 65%**	---	---	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☒ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☒ **NA**	---	M	---

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

A	☐ **Vegetated Component >5 acres**						☒ **Vegetated Component 1-5 acres**						☐ **Vegetated Component <1 acre**					
B	☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☒ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**	
C	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
P/P	---	---	---	---	---	---	---	---	---	.4M	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Forsyth NW - Treasure Co. Line

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☒ **YES**, add 0.1 to score in **ii** = 0.50 ☐ **NO**

iv. Final Score and Rating: .5M **Comments:** AA bordered by I-94 to north.

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and ii below.

i. Discharge Indicators
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☐ Vegetation growing during dormant season/drought.
- ☐ Wetland occurs at the toe of a natural slope.
- ☐ Seeps are present at the wetland edge.
- ☐ AA permanently flooded during drought periods.
- ☐ Wetland contains an outlet, but no inlet.
- ☒ Shallow water table and the site is saturated to the surface.
- ☐ Other: _____

ii. Recharge Indicators
- ☐ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

iii. Rating: Use the information from i and ii above and the table below to select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☒ **P/P**	☐ **S/I**	☐ **T**	☐ **None**
☒ **Groundwater Discharge or Recharge**	1H	---	---	---
☐ **Insufficient Data/Information**	---			

Comments: Hydrology for site provided by seasonal high groundwater table and surface runoff

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant
☐ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	.3L	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: type is common in area

14L. RECREATION / EDUCATION POTENTIAL ☐ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☒ **YES**, go to ii. ☐ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☒ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational ☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	.1M	---

Comments: Site owned by MDT but without general public access due to the proximity of I-94.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Forsyth NW - Treasure Co. Line

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	mod 0.60	1.00	1.0	
C. General Wildlife Habitat	mod 0.70	1.00	1.2	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.40	1.00	0.7	
F. Short and Long Term Surface Water Storage	high 0.80	1.00	1.4	*
G. Sediment / Nutrient / Toxicant Removal	high 0.90	1.00	1.6	*
H. Sediment / Shoreline Stabilization	NA	NA	0	
I. Production Export / Food Chain Support	mod 0.50	1.00	0.9	
J. Groundwater Discharge / Recharge	high 1.00	1.00	1.74	*
K. Uniqueness	low 0.30	1.00	0.5	
L. Recreation / Education Potential (bonus point)	mod 0.10		0.1	
Total Points	**5.30**	**9**	**9.3 Total Functional Units**	
Percent of Possible Score 59% (round to nearest whole number)				

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

☒ **Category III Wetland:** (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

APPENDIX C
PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Forsyth – Northwest
Rosebud County, Montana

Forsyth Northwest – West Site: Photo Point Photographs



Photo Point 1; Location: NE Corner of SE End; Bearing 270 degrees; Year 2014



Photo Point 1; Location: NE Corner of SE End; Bearing 270 degrees; Year 2015



Photo Point 1; Location: NE Corner of SE End; Bearing 270 degrees; Year 2016



Photo Point 1; Location: NE Corner of SE End; Bearing 270 degrees; Year 2017

Forsyth Northwest – West Site: Photo Point Photographs



Photo Point 2; Location: SW Corner of SE End – Shows dike breach ; Bearing 350 degrees; Year 2014



Photo Point 2; Location: SW Corner of SE End – Shows dike breach; Bearing 350 degrees; Year 2015



Photo Point 2; Location: SW Corner of SE End – Shows dike breach; Bearing 350 degrees; Year 2016



Photo Point 2; Location: SW Corner of SE End – Shows dike repair; Bearing 350 degrees; Year 2017

Forsyth Northwest – West Site: Photo Point Photographs



Photo Point 3; Location: NE side near middle of site; Bearing 230 degrees; Year 2014



Photo Point 3; Location: NE side near middle of site; Bearing 230 degrees; Year 2015



Photo Point 3; Location: NE side near middle of site; Bearing 230 degrees; Year 2016



Photo Point 3; Location: NE side near middle of site; Bearing 230 degrees; Year 2017

Forsyth Northwest – West Site: Photo Point Photographs



Photo Point 4; Location: NE corner of NW end; Bearing 210 degrees; Year 2014



Photo Point 4; Location: NE corner of NW end; Bearing 210 degrees; Year 2015



Photo Point 4; Location: NE corner of NW end; Bearing 210 degrees; Year 2016



Photo Point 4; Location: NE corner of NW end; Bearing 210 degrees; Year 2017

Forsyth Northwest – West Site: Photo Point Photographs



Photo Point 5; Location: SW side near middle of site; Bearing 45 degrees; Year 2014



Photo Point 5; Location: SW side near middle of site; Bearing 45 degrees; Year 2015



Photo Point 5; Location: SW side near middle of site; Bearing 45 degrees; Year 2016



Photo Point 5; Location: SW side near middle of site; Bearing 45 degrees; Year 2017

Forsyth Northwest – West Site: Photo Point Photographs

	
Photo Point 6 Bearing: 45 degrees Location: Center of new dike Year: 2017	Photo Point 6 Bearing: 225 degrees Location: Center of new dike Year: 2017

Forsyth Northwest – West Site: Transect Photographs



Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2013



Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2014



Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2015



Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2016



Transect 1: Start Location: SE end
Bearing: 25 degrees Year: 2017

Forsyth Northwest – West Site: Transect Photographs



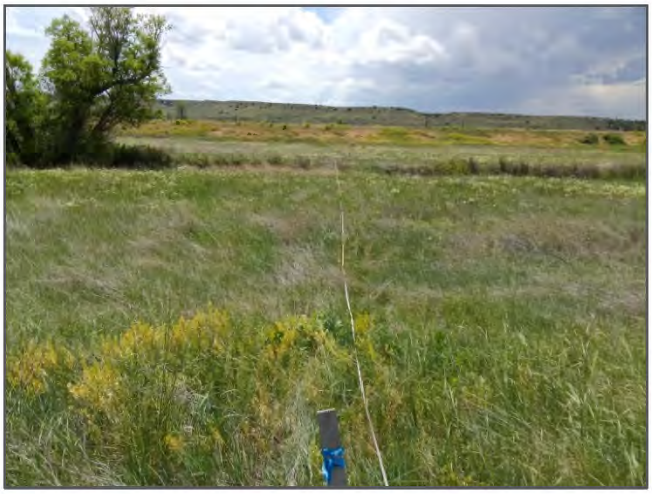
Transect 1: End Location: SE end
Bearing: 205 degrees Year: 2013



Transect 1: End Location: SE end
Bearing: 205 degrees Year: 2014



Transect 1: End Location: SE end
Bearing: 205 degrees Year: 2015



Transect 1: End Location: SE end
Bearing: 205 degrees Year: 2016



Transect 1: End Location: SE end
Bearing: 205 degrees Year: 2017

Forsyth Northwest – West Site: Transect Photographs



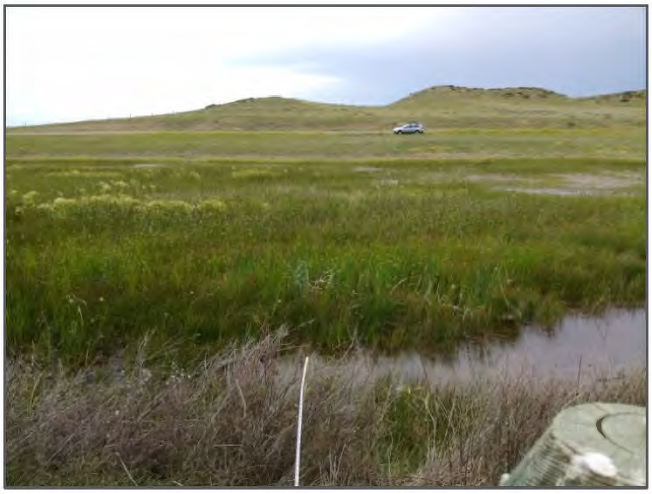
Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2013



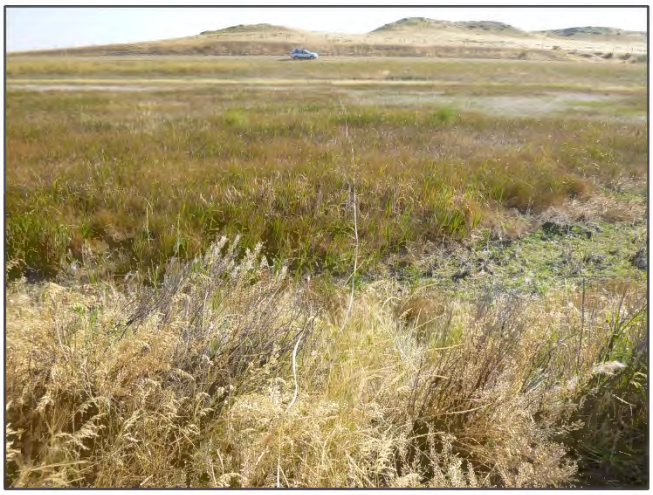
Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2014



Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2015



Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2016



Transect 2: Start Location: NW End
Bearing: 25 degrees Year: 2017

Forsyth Northwest – West Site: Transect Photographs



Transect 2: End Location: Northwest End
Bearing: 205 degrees Year: 2013



Transect 2: End Location: Northwest End
Bearing: 205 degrees Year: 2014



Transect 2: End Location: Northwest End
Bearing: 205 degrees Year: 2015



Transect 2: End Location: Northwest End
Bearing: 205 degrees Year: 2016



Transect 2: End Location: Northwest End
Bearing: 205 degrees Year: 2017

Forsyth Northwest – West Site: Data Point Photographs

	
Data Point: DP-1W Location: NE part of site Year: 2017	Data Point: DP-1U Location: NE part of site Year: 2017

Forsyth Northwest – Middle: Photo Point Photographs



Photo Point: 1 Location: Northwest End
Bearing: 300 degrees Year: 2013



Photo Point: 1 Location: Northwest End
Bearing: 300 degrees Year: 2014



Photo Point: 1 Location: Northwest End
Bearing: 300 degrees Year: 2015



Photo Point: 1 Location: Northwest End
Bearing: 300 degrees Year: 2016



Photo Point: 1 Location: Northwest End
Bearing: 300 degrees Year: 2017

Forsyth Northwest – Middle: Photo Point Photographs



Photo Point: 2 Location: Southeast end
Bearing: 120 degrees Year: 2013



Photo Point: 2 Location: Southeast end
Bearing: 120 degrees Year: 2014



Photo Point: 2 Location: Southeast end
Bearing: 120 degrees Year: 2015



Photo Point: 2 Location: Southeast end
Bearing: 120 degrees Year: 2016



Photo Point: 2 Location: Southeast end
Bearing: 120 degrees Year: 2017

Forsyth Northwest – Middle: Transect Photographs



Transect 1: Start
Location: Middle of Site
Bearing: 205 degrees
Year: 2013



Transect 1: Start
Location: Middle of Site
Bearing: 205 degrees
Year: 2014



Transect 1: Start
Location: Middle of Site
Bearing: 205 degrees
Year: 2015



Transect 1: Start
Location: Middle of Site
Bearing: 205 degrees
Year: 2016



Transect 1: Start
Location: Middle of Site
Bearing: 205 degrees
Year: 2017

Forsyth Northwest – Middle: Transect Photographs



Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2013



Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2014



Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2015



Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2016



Transect 1: End
Bearing: 25 degrees
Location: Middle of Site
Year: 2017

Forsyth Northwest – Middle: Data Point Photographs



Data Point: DP-1W Location: Middle of site
Year: 2017



Data Point: DP-1U Location: Middle of site
Year: 2017

Forsyth Northwest – East Site: Photo Point Photographs



Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2013



Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2014



Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2015



Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2016



Photo Point: 1 Location: NW end of site
Bearing: 125 degrees Year 2017

Forsyth Northwest – East Site: Photo Point Photographs



Photo Point 2; Location: Near Center of Site; Bearing 210 degrees; Year 2014



Photo Point 2; Location: Near Center of Site; Bearing 210 degrees; Year 2015



Photo Point 2; Location: Near Center of Site; Bearing 210 degrees; Year 2016



Photo Point 2; Location: Near Center of Site; Bearing 210 degrees; Year 2017

Forsyth Northwest – East Site: Photo Point Photographs



Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2013



Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2014



Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2015



Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2016



Photo Point: 3 Location: Southeast end of site
Bearing: 305 degrees Year 2017

Forsyth Northwest – East Site: Transect Photographs



Transect 1: Start Location: Northwest End
Bearing: 145 degrees Year 2013



Transect 1: Start Location: Northwest End
Bearing: 145 degrees Year 2014



Transect 1: Start Location: Northwest End
Bearing: 145 degrees Year 2015



Transect 1: Start Location: Northwest End
Bearing: 145 degrees Year 2016



Transect 1: Start Location: Northwest End
Bearing: 145 degrees Year 2017

Forsyth Northwest – East Site: Transect Photographs



Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2013



Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2014



Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2015



Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2016



Transect 1: End
Bearing: 325 degrees
Location: Northwest End
Year 2017

Forsyth Northwest – East Site: Transect Photographs



Transect 2: Start Location: Southeast End
Bearing: 280 degrees Year 2013



Transect 2: Start Location: Southeast End
Bearing: 280 degrees Year 2014



Transect 2: Start Location: Southeast End
Bearing: 280 degrees Year 2015



Transect 2: Start Location: Southeast End
Bearing: 280 degrees Year 2016



Transect 2: Start Location: Southeast End
Bearing: 280 degrees Year 2017

Forsyth Northwest – East Site: Transect Photographs



Transect 2: End Location: Southeast End
Bearing:100 degrees Year 2013



Transect 2: End Location: Northwest End
Bearing: 100 degrees Year 2014



Transect 2: End Location: Northwest End
Bearing: 100 degrees Year 2015



Transect 2: End Location: Northwest End
Bearing: 100 degrees Year 2016



Transect 2: End Location: Northwest End
Bearing: 100 degrees Year 2017

Forsyth Northwest – East Site: Data Point Photographs



Data Point: DP-1W Location: Northwest end of site
Year: 2017



Data Point: DP-1U Location: Northwest end of site
Year: 2017



Data Point: DP-2U Location: Central (upland) part of site
Year: 2017

Forsyth Northwest – Treasure Co. Line: Photo Point Photographs



Photo Point 1; Location: NE Corner of wetland; Bearing 180 degrees; Year 2014

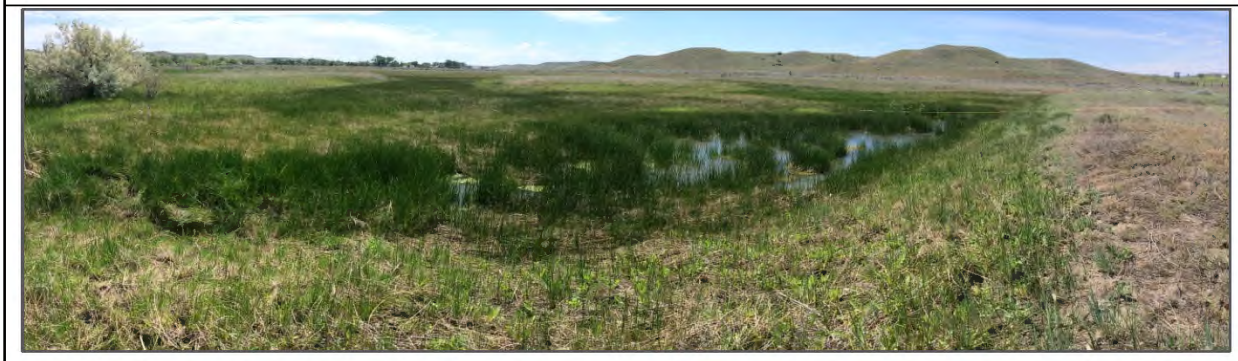


Photo Point 1; Location: NE Corner of wetland; Bearing 180 degrees; Year 2015



Photo Point 1; Location: NE Corner of wetland; Bearing 180 degrees; Year 2016



Photo Point 1; Location: NE Corner of wetland; Bearing 180 degrees; Year 2017

Forsyth Northwest – Treasure Co. Line: Photo Point Photographs



Photo Point 2; Location: NW Corner of Wetland; Bearing 180 degrees; Year 2014



Photo Point 2; Location: NW Corner of Wetland; Bearing 180 degrees; Year 2015



Photo Point 2; Location: NW Corner of Wetland; Bearing 180 degrees; Year 2016



Photo Point 2; Location: NW Corner of Wetland; Bearing 180 degrees; Year 2017

Forsyth Northwest – Treasure Co. Line: Photo Point Photographs



Photo Point 3; Location: SW corner of wetland; Bearing 180 degrees; Year 2014



Photo Point 3; Location: SW corner of wetland; Bearing 180 degrees; Year 2015



Photo Point 3; Location: SW corner of wetland; Bearing 180 degrees; Year 2016



Photo Point 3; Location: SW corner of wetland; Bearing 180 degrees; Year 2017

Forsyth Northwest – Treasure Co. Line: Photo Point Photographs



Photo Point 4; Location: SE Corner of Wetland; Bearing 180 degrees; Year 2014



Photo Point 4; Location: SE Corner of Wetland; Bearing 180 degrees; Year 2015



Photo Point 4; Location: SE Corner of Wetland; Bearing 180 degrees; Year 2016



Photo Point 4; Location: SE Corner of Wetland; Bearing 180 degrees; Year 2017

Forsyth Northwest – Treasure Co. Line: Transect Photographs



Transect 1: Start
Bearing: 190 degrees
Location: South half of wetland
Year: 2013



Transect 1: Start
Bearing: 190 degrees
Location: South half of wetland
Year: 2014



Transect 1: Start
Bearing: 190 degrees
Location: South half of wetland
Year: 2015

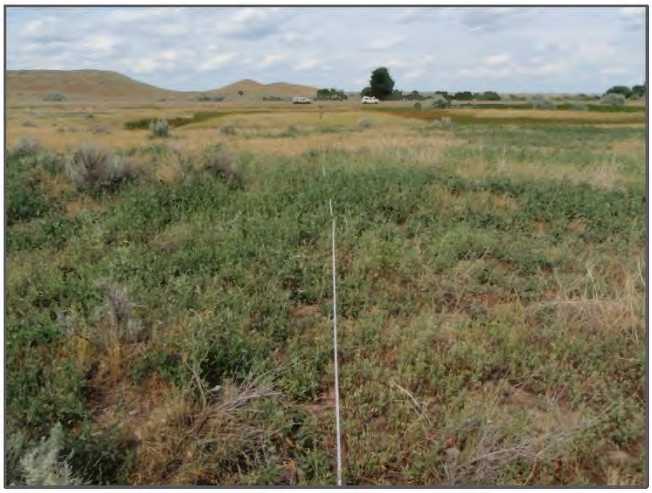


Transect 1: Start
Bearing: 190 degrees
Location: South half of wetland
Year: 2016

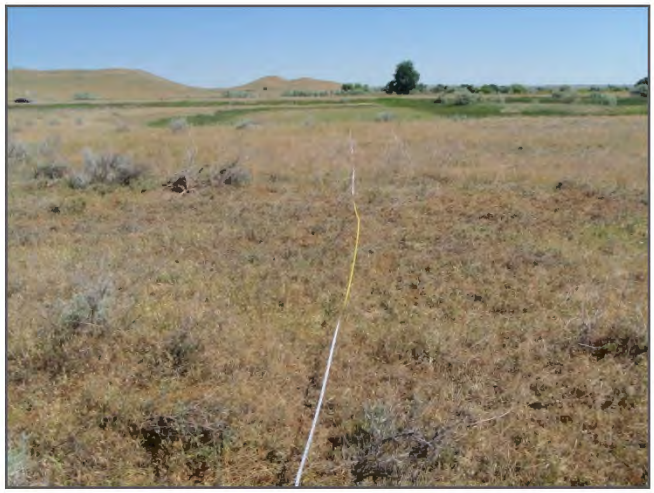


Transect 1: Start
Bearing: 190 degrees
Location: South half of wetland
Year: 2017

Forsyth Northwest – Treasure Co. Line: Transect Photographs



Transect 1: End
Bearing: 10 degrees
Location: South half of wetland
Year: 2013



Transect 1: End
Bearing: 10 degrees
Location: South half of wetland
Year: 2014



Transect 1: End
Bearing: 10 degrees
Location: South half of wetland
Year: 2015



Transect 1: End
Bearing: 10 degrees
Location: South half of wetland
Year: 2016



Transect 1: End
Bearing: 10 degrees
Location: South half of wetland
Year: 2017

Forsyth Northwest – Treasure Co. Line: Data Point Photographs



Data Point: DP-1W Location: NE part of site
Year: 2017



Data Point: DP-1U Location: NE part of site
Year: 2017

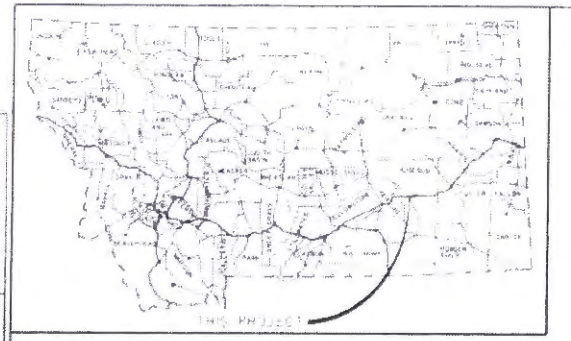
APPENDIX D
PROJECT PLAN SHEETS

MDT Wetland Mitigation Monitoring
Forsyth – Northwest
Rosebud County, Montana

MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. STPP 14-6(10)259
PMS OVERLAY, RECONSTRUCTION, PULVERIZATION
FORSYTH – NORTHWEST
ROSEBUD COUNTY

LENGTH 19.1 kilometers

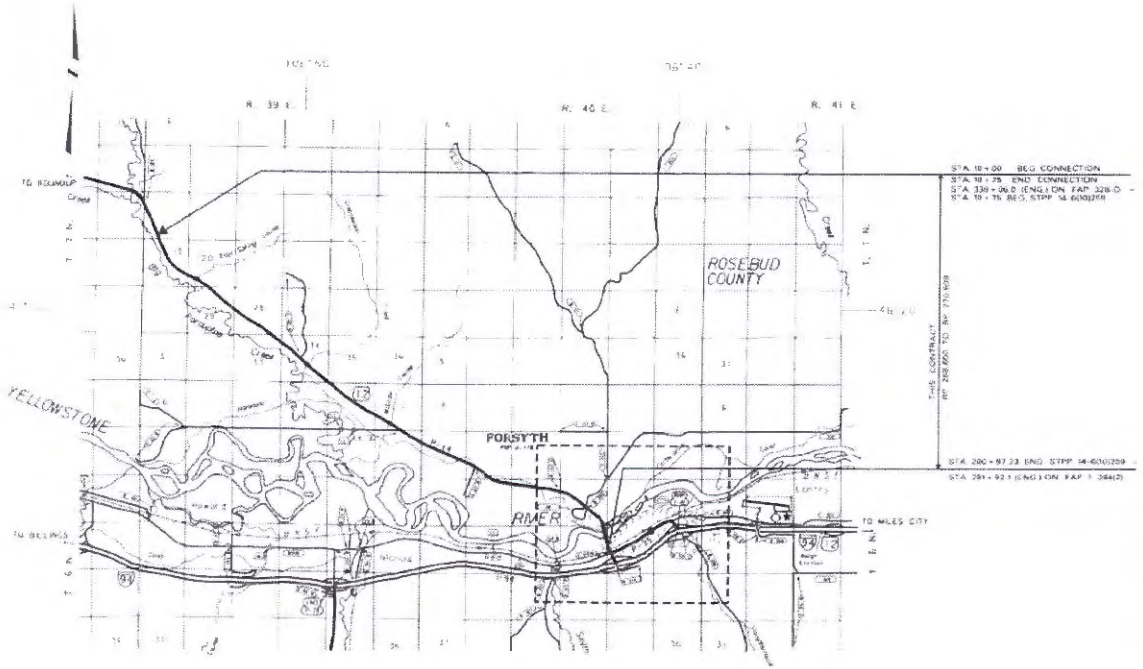


DESIGN DATA

3505 A.D.T. = 240
2026 A.D.T. = 300
D.H.V. = 60
D = 55% 65%
T = 19.6%
V = 90 km/h
ALL TRUCKS = 47.3%
80 kN ESAL'S = 28.98
GROWTH RATE = 1.5%

LETTING DATE _____

SURFACING SOURCE CONTRACTOR FURNISHED
CSF = 0.999347953



RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS

R/W & U.C.	STPP 14-6(11)259
P.E.	STPP 14-6(9)259

CONTROL NO. 4258

MONTANA DEPARTMENT OF TRANSPORTATION

APPROVED OCTOBER 27 20 11

TIM REARDON
DIRECTOR OF TRANSPORTATION

BY _____
CONSULTANT DESIGN ENGINEER

TIMOTHY J. CONWAY 7642679 REGISTERED ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	2

TABLE OF CONTENTS

ROAD PLANS	SHEET NO.
TITLE SHEET	1
TABLE OF CONTENTS	2
NOTES	3
LINEAR & LEVEL DATA	3
CONTROL TRAVERSE DIAGRAM	4
TYPICAL SECTIONS	5, 6, 6A
SUMMARIES	7-11
HYDRAULIC DATA SUMMARY	13

DETAILS	14 25

PLAN & PROFILE	SHEET NO.
MAINLINE	30 57
SIGNING PLANS	
SUMMARY	S-
SIGN LOCATIONS & SPECIFICATIONS	S 2, 3
PLANS	S-4-17
BRIDGE PLANS	
QUANTITY SHEET & LIST OF DWGS.	B-1
PLANS	B2-16
CROSS SECTIONS	
MAINLINE	1-313
WETLAND MITIGATION SITE 30+00 TO 38+000 RT.	314 317
WETLAND MITIGATION SITE 61+25 TO 64+20 LT.	318 320
WETLAND MITIGATION SITE 68+80 TO 71+07 LT.	321 324

SUMMARY

STATE	PROJECT NUMBER	SHEET NO
MONTANA	STPP 14-6(10)259	11

TOPSOIL & SEEDING

STATION FROM	STATION TO	TOPSOIL SALVAGING & PLACING (cubic meters)	SEED (hectares) NO. 1	SEED NO. 2	SEED NO. 3	FERTILIZER (hectares) NO. 1	FERTILIZER NO. 2	CONDITION SEEDBED AREAS 1 & 3 (hectares)	MULCH AREA 2 (hectares)	REMARKS
10+00	20+00	2398	1.1	0.9	1.0	1.1	0.9	4.	0.9	
20+00	30+00	3702	2.6	0.7	1.0	2.6	0.7	3.6	0.7	
30+00	40+00	2291	2.6	0.1	1.0	2.8	0.1	3.6	0.1	
40+00	50+00	1821	2.0		1.0	2.0		3.4		
50+00	60+00	2203	2.5	0.1	1.0	2.5	0.1	3.5	0.1	
60+00	70+00	2328	3.6	0.1	1.0	3.8	0.1	4.8	0.1	
70+00	80+00	2358	2.5	0.1	1.0	2.5	0.1	3.5	0.1	
80+00	90+00	2278	2.2	0.2	1.0	2.2	0.2	3.2	0.2	
90+00	100+00	2142	2.1		1.0	2.1	0.	3.1	0.	
100+00	110+00	2373	2.8		1.0	2.8		3.8	0.	
110+00	120+00	2019	2.2		1.0	2.2		3.2		
120+00	130+00	1963	2.4	1.4	1.0	2.4	1.4	3.4	1.4	
130+00	140+00	2378	3.4	0.	1.0	3.4	0.	4.4	0.1	
140+00	150+00	2138	3.9	0.	1.0	3.9	0.	4.9	0.1	
150+00	160+00	2239	3.0		1.0	3.0		4.0		
160+00	170+00	826	2.8		1.0	2.8		3.8		
170+00	180+00	2248	1.8		1.0	1.8		2.8		
180+00	190+00	2811	6.3	0.4	1.0	6.3	0.4	7.3	0.4	
190+00	197+00	2048	2.8	1.4	0.7	2.8	1.4	3.5	1.4	
TOTAL		426 h	52.8	6.	18.7	52.8	6.	71.5	6.	

FINISH GRADE CONTROL

STATION FROM	STATION TO	COURSE AGGREGATES (meters) FINISH GRADE CONTROL	REMARKS
10+00	52+00	4.2	SUBGRADE
10+00	52+00	4.2	TOP CAC
52+00	72+20	2.0	SUBGRADE MATERIAL
52+00	72+20	2.0	BASE COURSE MATERIAL
72+20	96+98	12.5	SUBGRADE
72+20	96+98	12.5	TOP BASE COURSE
TOTAL		37.4	

APPROACH PIPE (INCLUDED IN CULVERT SUMMARY RECAP)

STATION	BASIC BID ITEMS: CULVERT PIPE (m)	LENGTH OF PIPE (meters)	RELAY CULVERT (meters)	CLEAN CULVERT (meters)	CULVERT EXCAVATION (cubic meters)	PIPE OPTIONS (m): CONCRETE CLASS 2	STEEL 68 x 13 CORR. 1.63 THK.	ALUMINUM 68 x 13 CORR. 1.52 THK.	CORRUGATED POLYETHYLENE PIPE	END SECTIONS LEFT	END SECTIONS RIGHT	HEIGHT OF COVER (meters)	SKEW ANGLE	REMOVE CULVERT mm x m	REMARKS
14+93	450	12.0			1	450				FETS	FETS	0.3			APP. LT.
38+28	450	12.5			4	450			450	FETS	FETS	0.6		610 x 18.0 RCP	APP. LT.
39+38	600	12			24	600			600	FETS	FETS	0.6		610 x 18.0 RCP	APP. RT.
44+89					13									762 x 9.3 CSP	APP. LT.
49+89					13									381 x 5.3 RCP	APP. RT.
53+35	1200	33.0			24	1200				FETS	FETS	0.4		762 x 9.3 CSP	APP. LT.
63+45	600	14.0			15	600				FETS	FETS	1.2		610 x 9.3 CSP	APP. RT.
66+26	900	11.0			19	900				FETS	FETS	0.4		610 x 8.0 CSP	APP. RT.
69+37	450	11.0			5	450				FETS	FETS	0.3			
74+18	450	11.0			10	450				FETS	FETS	0.3			APP. LT.
77+84	600	12.5			30	600			600	FETS	FETS	0.8		610 x 12.5 RCP	APP. LT.
84+34	600	12.5			30	600				FETS	FETS	0.6		610 x 12.5 RCP	APP. RT.
91+30	450	11.0			29	450	450	450	450	FETS	FETS	0.6		457 x 12.5 RCP	APP. LT.
109+18	600	11.0			20	600	600	600		FETS	FETS	0.3		254 x 18.7 CSP	APP. RT.
114+18	600	11.0			20	600	600	600		FETS	FETS	0.3		610 x 7.1 RCP	APP. LT.
118+62	600	11.0			20	600	600	600		FETS	FETS	0.3		610 x 9.2 CSP	APP. RT.
124+95	750	26.5			5	750	750	750		FETS	FETS	0.3		457 x 12.5 CSP	APP. LT.
134+95	750	27.0			5	750	750	750		FETS	FETS	0.3			APP. RT.
144+40	450	11.0			5	450	450	450	450	FETS	FETS	0.8		762 x 11.0 CSP	APP. RT. REMOVE 1.0 m RET.
154+36	450	11.0			5	450	450	450	450	FETS	FETS	0.8		381 x 12.6 CSP	APP. LT.
162+51	450	11.0			20	450	450	450	450	FETS	FETS	0.6		457 x 12.2 CSP	APP. LT.
170+66	450	11.0			15	450	450	450	450	FETS	FETS	0.6		457 x 12.2 CSP	APP. LT.
174+95	450	11.0			10	450	450	450	450	FETS	FETS	0.1		483 x 12.2 CSP	APP. LT.
179+24	450	11.0			6	450	450	450	450	FETS	FETS	0.6			APP. LT.
183+46	600	12.5			30	600	600	600	600	FETS	FETS	0.3			APP. LT.
185+33	600	85.0			20	600	600	600	250	FETS	FETS	1.		610 x 11.0 CSP	APP. LT.
TOTAL					*									2118	

* QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY

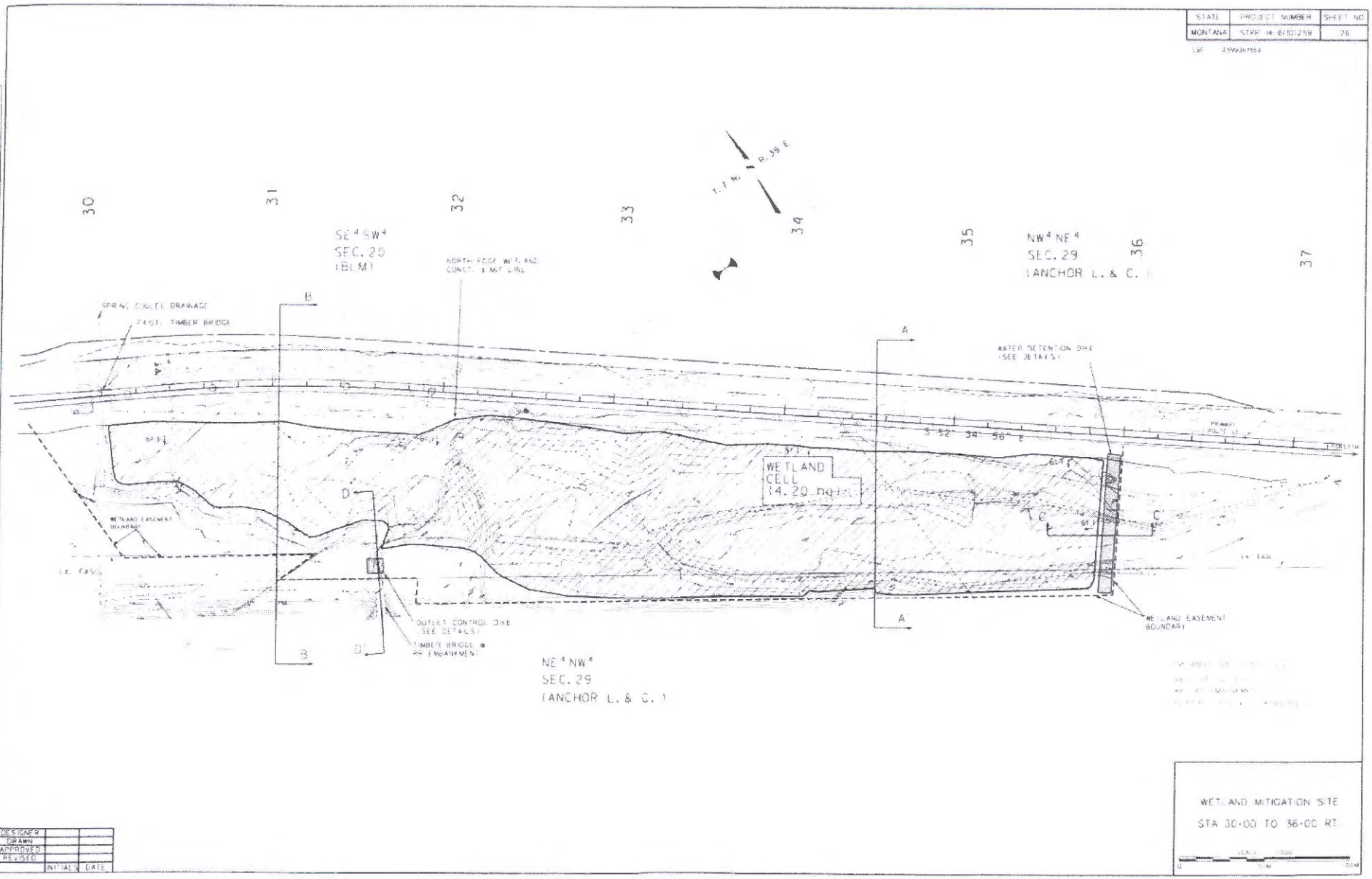
WATER LINE

STATION	STEEL CASING SCH. #10 (meters)	REMARKS
	100 mm	MIN. 0.6 m COVER CAP ENDS
12+07	37	PLACE MARKER AT R/W
TOTAL	57	LINE AT BOTH ENDS

WETLAND SITE

STATION FROM	STATION TO	JUMP SIZE WETLAND MITIGATION SITE	REMARKS
30+00	36+20	0.6	RT.
47+21	64+20	0.2	LT.
68+80	71+87	0.2	LT.
TOTAL		1.0	

REVISED → 4.2 ha


STATE
PROJECT NUMBER
SHEET NO.
MONTANA
STPP (4 6610)259
26
MDT
MONTANA DEPARTMENT OF TRANSPORTATION
30
31
32
33
34
35
36
37
T 17 N, R 39 E
SE¼ SW¼
SEC. 29
(BLM)
NW¼ NE¼
SEC. 29
(ANCHOR L. & C.)
SPRING OUTLET DRAINAGE
EXIST. TIMBER BRIDGE
WATER DETENTION DIKE
(SEE DETAILS)
WETLAND
CELL
14.20 Ac±
WETLAND EASEMENT
BOUNDARY
OUTLET CONTROL DIKE
(SEE DETAILS)
TIMBER BRIDGE
TO BE REMOVED
NE¼ NW¼
SEC. 29
(ANCHOR L. & C.)
WETLAND EASEMENT
BOUNDARY
DESIGNED
DRAWN
APPROVED
REVISED
INITIALS
DATE
WETLAND MITIGATION SITE
STA 30+00 TO 36+00 RT

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	27



TYPICAL SECTION A-A'

NO SCALE

NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

AREAS WITHIN THE CONSTRUCTION LIMITS THAT ARE ALREADY BELOW DESIGN ELEVATION 787.44 ARE TO BE "DAYLIGHTED IN TO", AND ARE NOT TO BE "FILLED" IN ANY WAY.



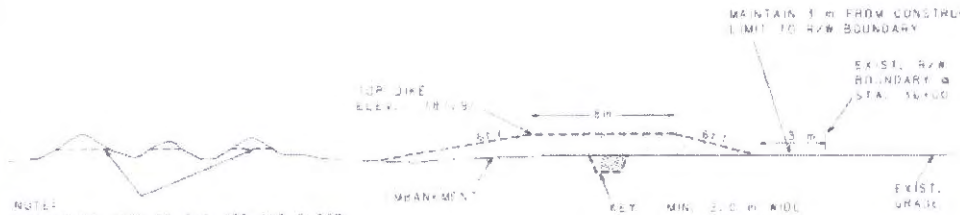
NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

DAYLIGHT EXCAVATION INTO EXISTING DRAINAGE ON ALL AREAS ADJACENT TO THE DRAINAGE.

MAINTAIN 3 m FROM CONSTRUCTION LIMIT TO EX. R/W

TYPICAL SECTION B-B'

NO SCALE



NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

AREAS WITHIN THE CONSTRUCTION LIMITS THAT ARE ALREADY BELOW DESIGN ELEVATION 787.44 ARE TO BE "DAYLIGHTED IN TO", AND ARE NOT TO BE "FILLED" IN ANY WAY.

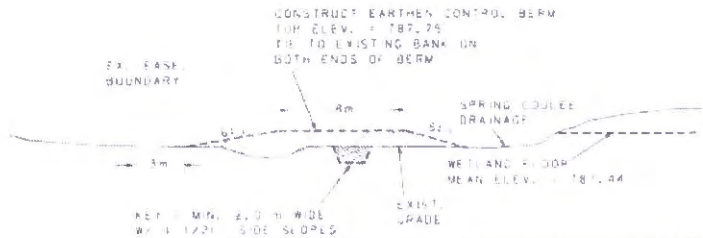
KEY - MIN. 2.0 m WIDE W/ 1:1 (2:1 SIDE SLOPES (FULL LENGTH OF DIKE)

EXTEND AND CONNECT DIKE AND KEY TO ROADWAY EMBANKMENT ON NORTH END AND RAILROAD EMBANKMENT ON SOUTH END

WATER RETENTION DIKE
TYPICAL SECTION C-C'

NO SCALE





NOTE: USE A 1-6 SOIL TO CONSTRUCT EMBANKMENT FOR ALL DIKES AND KEYWAYS. CONSTRUCT EMBANKMENTS AS PER SECTION 203.03.2 IN THE STANDARD SPECIFICATIONS. COMPLETE MOISTURE AND DENSITY REQUIREMENTS AS PER SECTION 203.03.3 IN THE STANDARD SPECIFICATIONS.

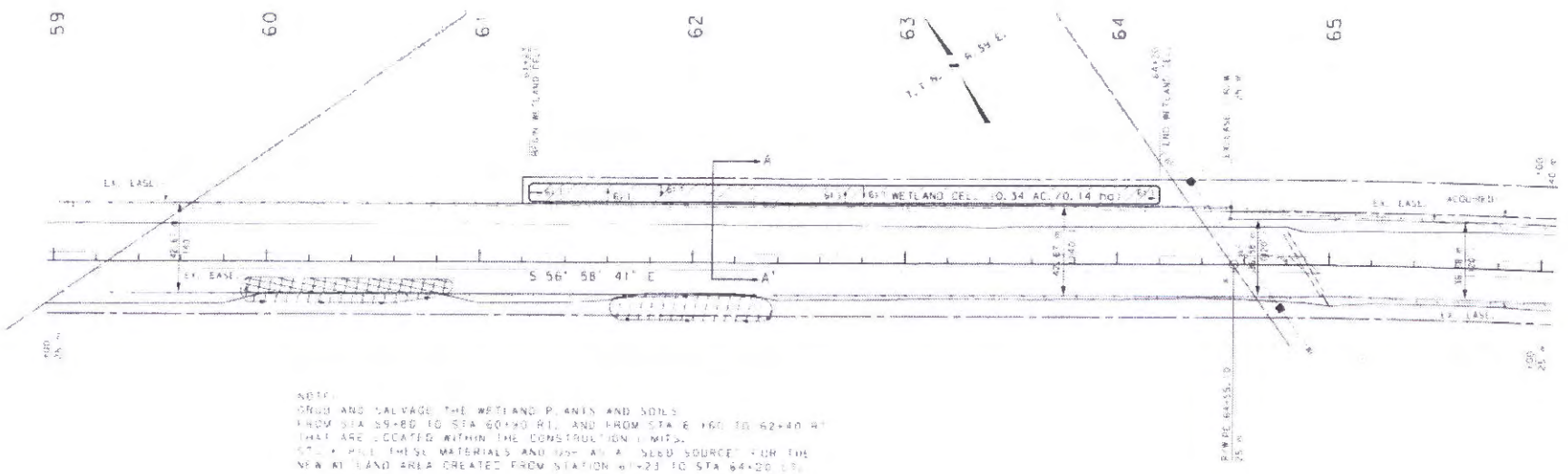
OUTLET CONTROL DIKE
TYPICAL SECTION D-D'

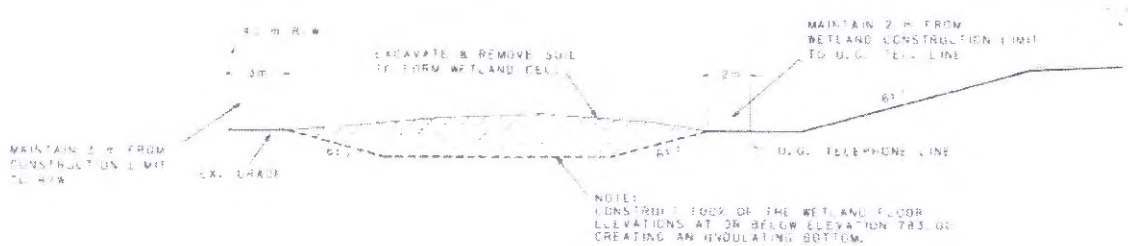
NO SCALE

	INITIALS	DATE
DESIGNED		
DRAWN		
APPROVED		
REVISED		

WETLAND MITIGATION STA. 1
STA. 30+00 TO 36+00 RT.
TYPICAL SECTIONS

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6430(25)9	28





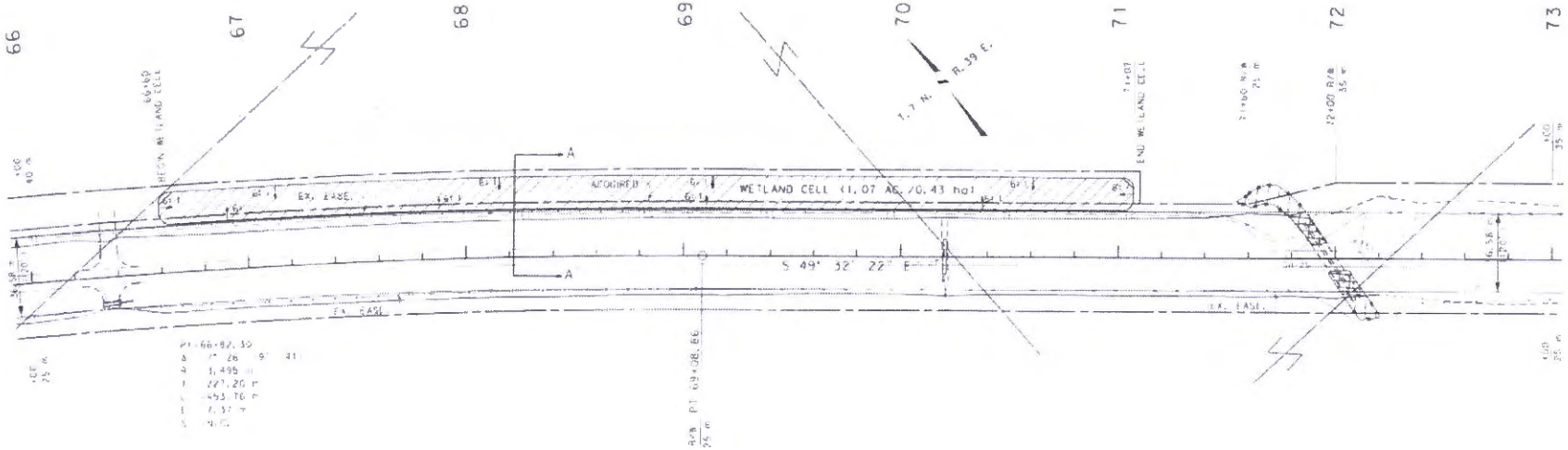
INFORMATIONAL QUANTITIES

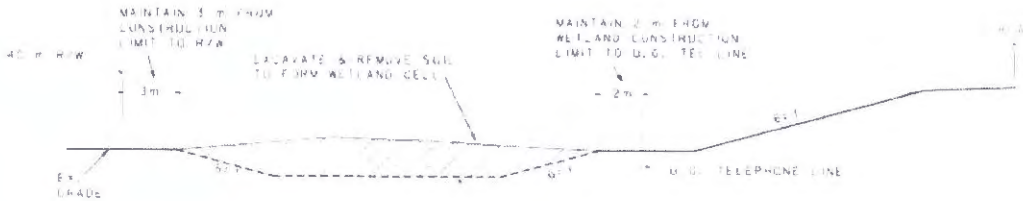
1325 m³ UNC EXC
0.14 ha SEEDING - AREA NO. 1

TYPICAL SECTION A-A'

NO SCALE

WETLAND MITIGATION SITE
STA 61+23 TO 64+20 LT.





NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 782.50 CREATING AN UNDULATING BOTTOM

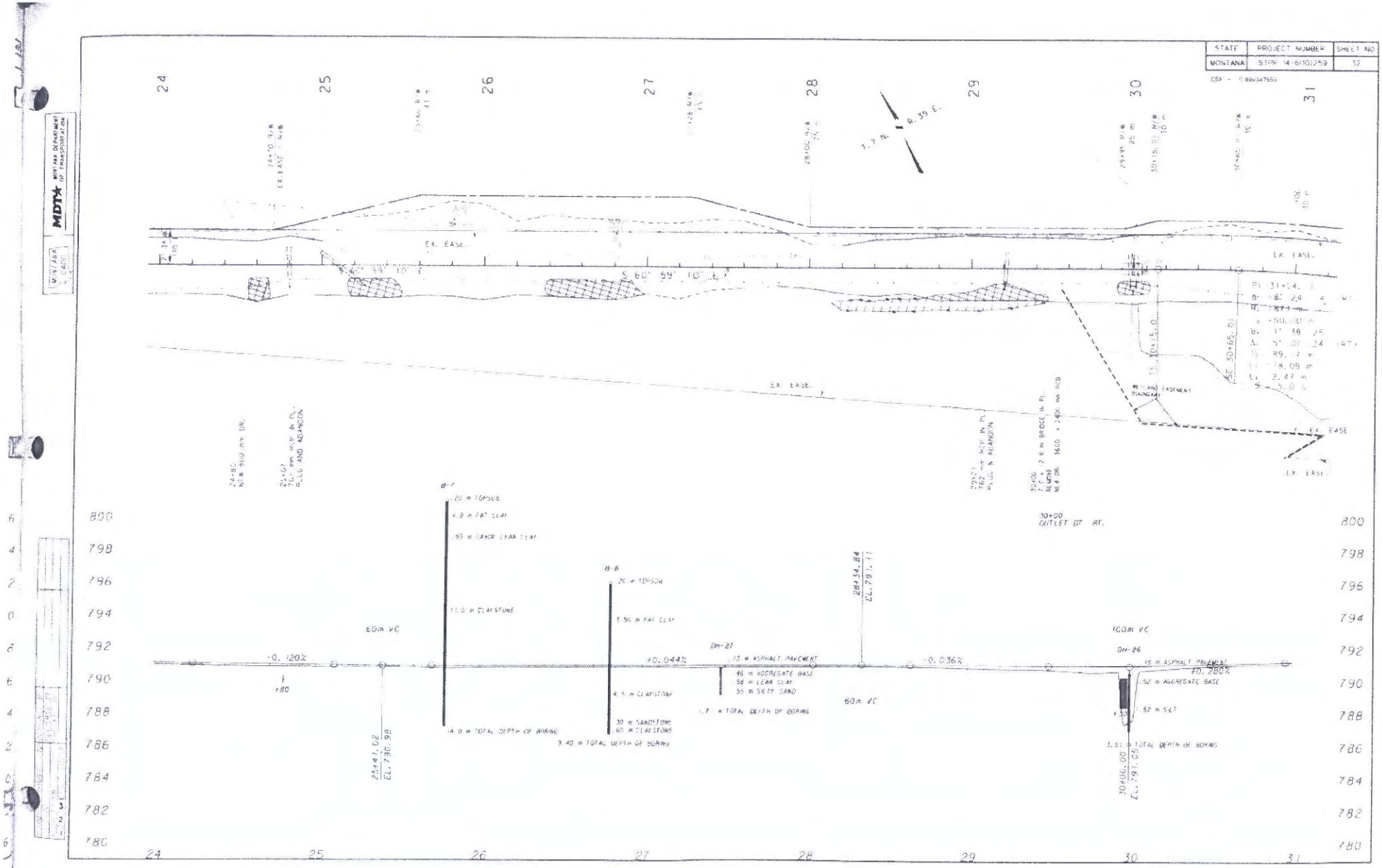
TYPICAL SECTION A-A'

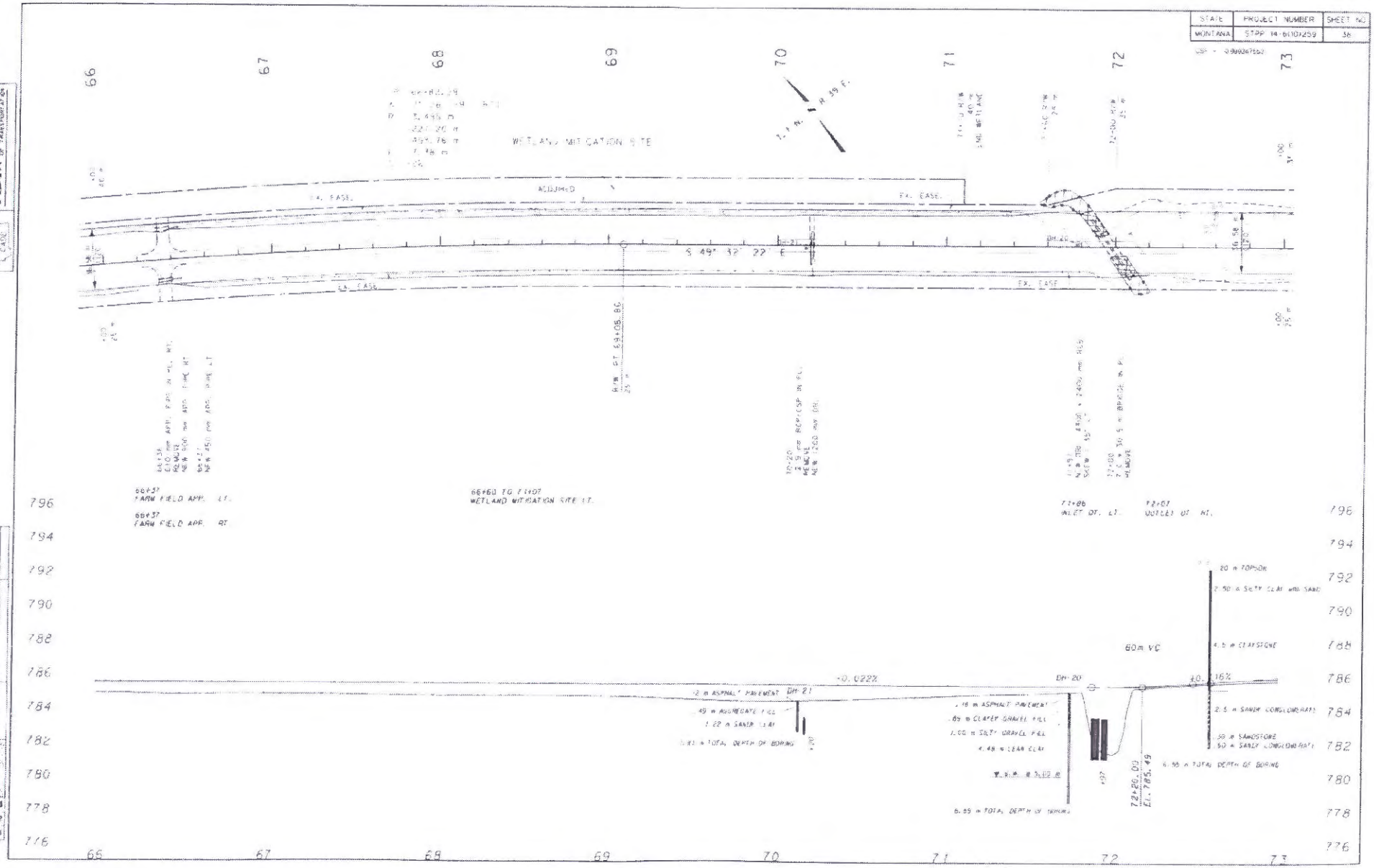
NO SCALE

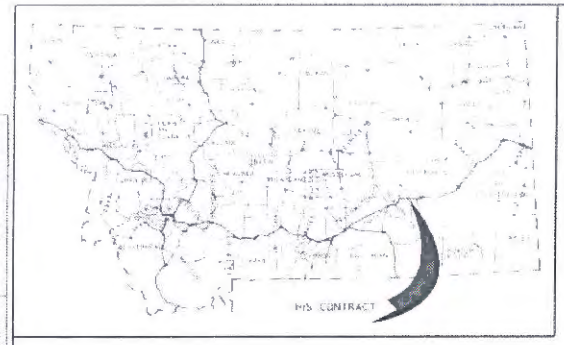
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	29

WETLAND MITIGATION SITE
STA 66+60 TO 71+07 LT

SCALE 1000


STATE
PROJECT NUMBER
SHEET NO
MONTANA
STPP 14-6(10)259
32
MDT
MONTANA DEPARTMENT OF TRANSPORTATION
24
25
26
27
28
29
30
31
EX. EASE.
EX. EASE
EX. EASE
EX. EASE
RR LAND EASEMENT BOUNDARY
30+00 CUTCET BT RT.
60m VC
160m VC
60m VC
-0.120%
+0.044%
-0.036%
+0.280%
+80
B-7
20 m TOPSOIL
4.5 m FAT CLAY
9.5 m LEAN CLAY
11.0 m CLAYSTONE
14.0 m TOTAL DEPTH OF BORING
B-8
20 m TOPSOIL
5.5 m FAT CLAY
4.5 m CLAYSTONE
30 m SANDSTONE
60 m CLAYSTONE
9.40 m TOTAL DEPTH OF BORING
BH-27
13 m ASPHALT PAVEMENT
46 m AGGREGATE BASE
58 m LEAN CLAY
95 m SILTY SAND
TOTAL DEPTH OF BORING
BH-26
13 m ASPHALT PAVEMENT
52 m AGGREGATE BASE
52 m SILT
5.51 m TOTAL DEPTH OF BORING
28+34.84
EL. 791.11
25+41.62
EL. 736.98
30+36.60
EL. 791.05
800
798
796
794
792
790
788
786
784
782
780


STATE
MONTANA
PROJECT NUMBER
STPP 14-6110(259)
SHEET NO.
56
WETLAND MITIGATION SITE
EX. CASE
S 49° 37' 22" E
66+37
FARM FIELD APP. LT.
66+37
FARM FIELD APP. RT.
66+60 TO 71+97
WETLAND MITIGATION SITE LT.
71+86
INLET DT. LT.
72+01
OUTLET DT. RT.
DH-20
DH-21
-0.022%
-0.16%
60m VC
72+20.03
EL. 785.49
66
67
68
69
70
71
72
73
796
794
792
790
788
786
784
782
780
778
776



MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. IM 94-3(49)78
MILL,FILL,PL.MIX OVERLAY,SEAL & COVER
TREASURE CO. LINE -EAST
ROSEBUD COUNTY

DESIGN DATA

LETTING DATE APRIL 22, 1999

LETTING DATE JULY 7, 2000

AS-BUILTS

LENGTH 11.5 kilometers

SCALES

VERTICAL 1 :

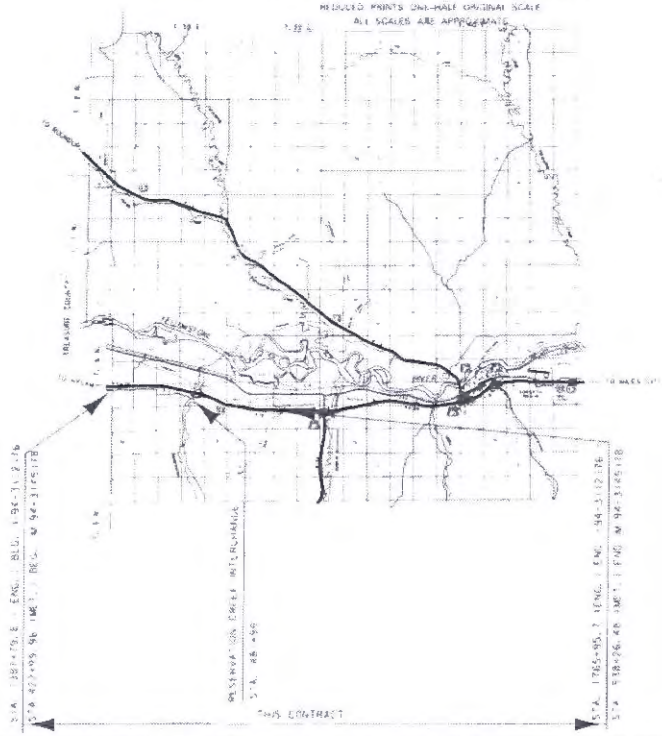
HORIZONTAL 1 :

CROSS SECTION HORIZONTAL & VERTICAL 1 :

REDUCED PRINTS ONE-HALF ORIGINAL SCALE

ALL SCALES ARE APPROXIMATE

SURFACING MATERIALS : CONTRACTOR FURNISHED



AS-BUILT PROJECT

APPROVED

FOR SECRETARY OF TRANSPORTATION

BY

PRECONSTRUCTION ENGINEER

FOR DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	IM 94-5(49)178	9

ADDENDUM AS-BUILTS
ATTACHMENT NO. 12

SUMMARY

PAVEMENT MARKINGS

ITEM	UNIT	REFRM APPLICATION	FINAL APPLICATION	TOTAL
WHITE PAINT	LITERS	1 578		2760
YELLOW PAINT	LITERS	1 182		2293
WHITE WORDS & SYMBOLS	LITERS	124		4
TEMP. PAVEMENT MARKINGS - OVERLAY	KM			133

RUMBLE STRIPS

STATION FROM	STATION TO	kilometers RUMBLE STRIP	REMARKS
422+99.84	538+26.95	11.5	WESTBOUND SHLD. RT.
422+99.84	538+26.95	11.2	WESTBOUND SHLD. LT.
423+00.08	538+26.40	11.5	EASTBOUND SHLD. LT.
423+00.08	538+26.40	11.0	EASTBOUND SHLD. RT.
TOTAL		45.1	

* WETLAND SITE (TEMP SITE)

STATION FROM	STATION TO	cubic meters UNCL. EXCAVATION *	cubic meters TOPSOIL SALVAGING AND PLACING	REMARKS
477+60.20	478+93.00	8 457		FOR NEW WETLAND AREA #7
TOTAL		8		

* SEE SPECIAL PROVISIONS
* FOR INFORMATION ONLY

CURB

STATION FROM	STATION TO	meters REMOVE BITUMINOUS CURB * LEFT	meters REMOVE BITUMINOUS CURB * RIGHT	meters REMOVE BITUMINOUS CURB * LEFT	meters REMOVE BITUMINOUS CURB * RIGHT	REMARKS
428+04	431+24		420.0		420.0	EASTBOUND SHLD. RT.
480+56	481+72		116.0		116.0	EASTBOUND SHLD. RT.
427+32	430+38	368.0		368.0		WESTBOUND SHLD. LT.
480+68	481+72	148.0		48.0		WESTBOUND SHLD. LT.
501+45	506+30	485.0		485.0		WESTBOUND SHLD. LT.
SUBTOTAL		939.0	536.0	835.0	536.0	
TOTAL		385.2		1371.0		

* SEE SPECIAL PROVISIONS FOR DISPOSAL

COLD MILLING

STATION FROM	STATION TO	meters COLD MILLING	REMARKS
EASTBOUND			
422+50.08	423+00.08	463	FULL WIDTH - TAPER 0-45 mm
423+00.08	514+73.10	104 341	11.58 m FULL WIDTH O.G.F.C. ONLY
423+00.08	514+73.10	34 353	3.81 m WIDTH - 60 mm
514+73.10	538+26.40	27 212	FULL WIDTH - O.G.F.C. ONLY
481+21.90	481+71.90	579	FULL WIDTH - TAPER 90 - 150 mm
482+28.61 BL	482+76.61	579	FULL WIDTH TAPER 90 - 150 mm
481+35.28	489+56.70	5 538	"R3" - FULL WIDTH - O.G.F.C. ONLY
482+19.46	486+67.36	2 131	"R4" FULL WIDTH - O.G.F.C. ONLY
		329	"R27" - 1 CAT. GRD. FULL WIDTH TAPER 0-45mm
538+26.40	538+66.40	463	FULL WIDTH - TAPER 0 - 45 mm
EASTBOUND	SUB-TOTAL	175995	
422+55.84	422+55.84	463	FULL WIDTH TAPER 0 - 45 mm
422+99.84	514+73.10	104 376	11.77 m WIDTH - O.G.F.C. ONLY
422+99.84	514+73.10	34 341	3.81 m WIDTH - 60 mm
514+73.10	538+26.95	27 210	FULL WIDTH - O.G.F.C. ONLY
481+25.90	481+71.90	579	FULL WIDTH TAPER 90 - 150 mm
482+28.61 BL	482+76.61	579	FULL WIDTH TAPER 90 - 150 mm
480+82.29	485+71.89	2 258	"R1" - FULL WIDTH - O.G.F.C. ONLY
487+10.34	487+98.56	4 258	"R2" - FULL WIDTH - O.G.F.C. ONLY
538+26.95 EOP	538+66.95	461	FULL WIDTH TAPER 0 - 45 mm
		329	"R27" - 1 CAT. GRD. FULL WIDTH TAPER 0-45mm
WESTBOUND	SUB-TOTAL	174864	
TOTAL		350779	E.& W.B.

GRADING

STATION FROM	STATION TO	cubic meters UNCL. EXCAVATION *	cubic meters EMBANKMENT IN PLACE	REMARKS
428+65.00		311		OUTLET DITCH
469+37.00	471+09.30	88 578		EA. S.SI. AREA RT.
482+28.00	482+45.30		0	GRADE TO DRAIN MED. AH. RES. DE.
TOTAL		88922	* * 0	

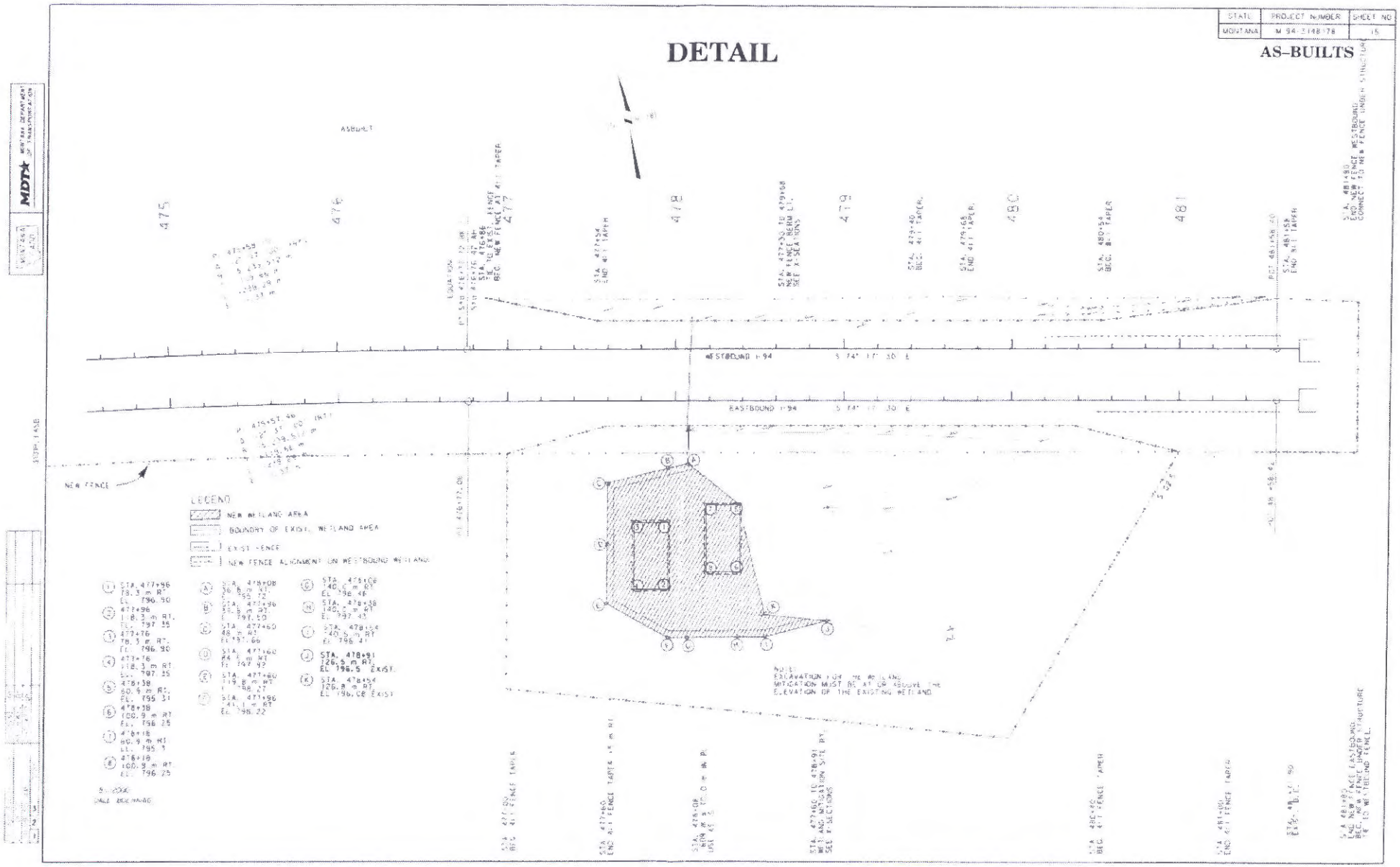
* CONTRACTOR TO WASTE MATERIAL
* * TO BE INCLUDED IN OTHER ITEMS OF THE PROJECT FOR INFORMATION ONLY

CULVERTS

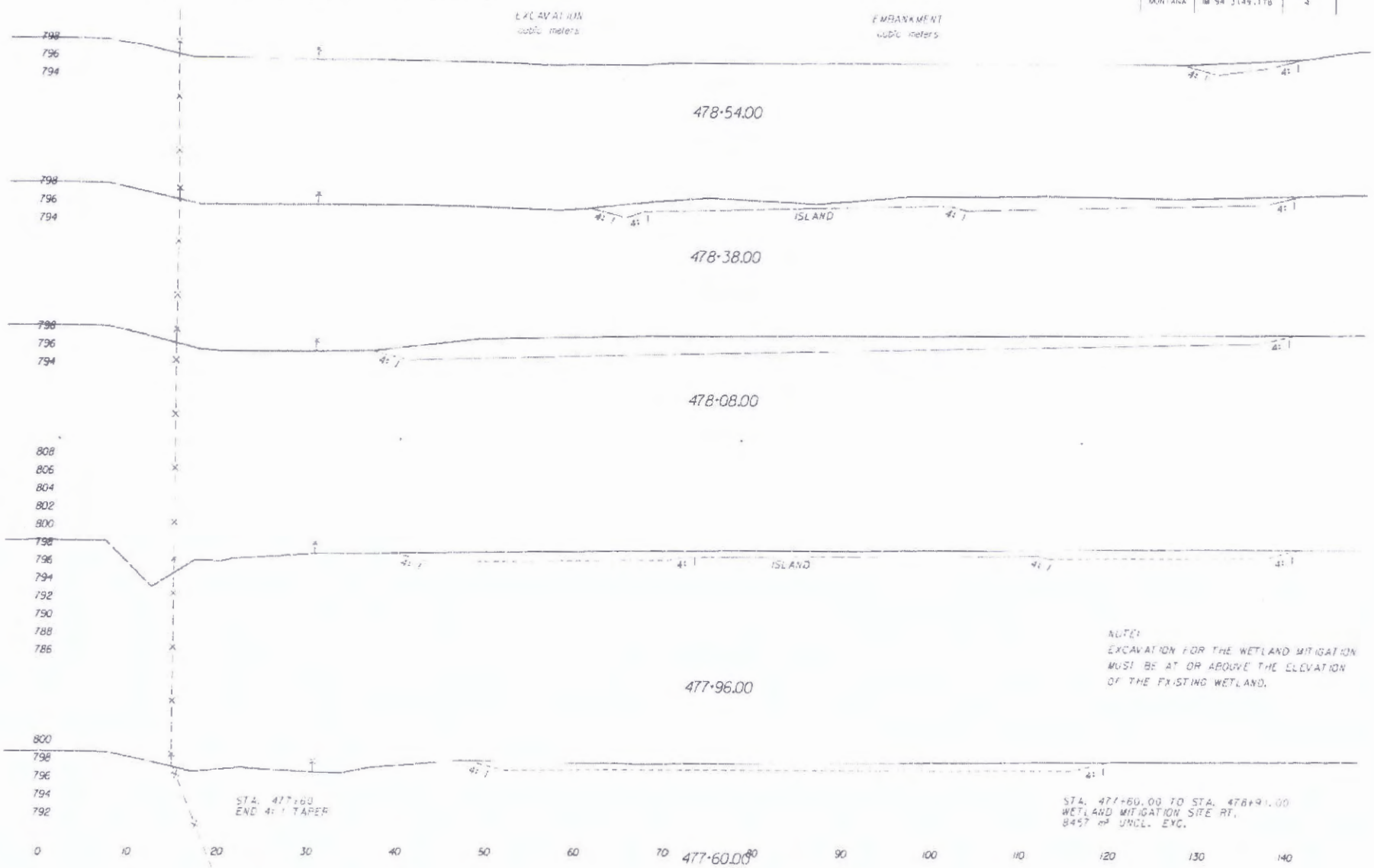
STATION	meters CSP 68 mm x 13mm 1.83 mm 600 mm	meters CSP 75 x 25 mm 2.12 mm 2700 mm	meters SSPP 152 x 51 mm 2.82 mm 3 960 m	END SECTIONS LEFT	END SECTIONS RIGHT	cubic meters CEMENT GROUT	C.Y.S. GRAVEL GRADE 2A	CLASS "OD" CONCRETE	meters CULVERT RIPRAP CLASS	meters CLEAN CULVERT	meters REMOVE	COATING	IN PLACE AM E.O.	REMARKS
422+55		6.0		FLARE	FLARE								600 mm x 76.3 mm	MEDIAN CROSSOVER - E.O.P.
428+61										149.7			3.66 m x 149.7 m	USE AS IS ROD OUTLET DITCH
469+39			9.1							61.5	6.0	# YES	7.0 m x 61.5 m	INSERTS W/TO NEW END SECTIONS
478+00		6.0								623 mm x 76.3 mm				MEDIAN CROSSOVER
501+38			14.0	21 STEP RACED	21 STEP RACED	260.0	231.0	9.0	18.0	74.6	9.1	# YES	1.67 m x 74.6 m	INSERTS WITH NEW END SECTIONS
TOTAL		20	40	02		3324	320	44	22	284.3	15.1			

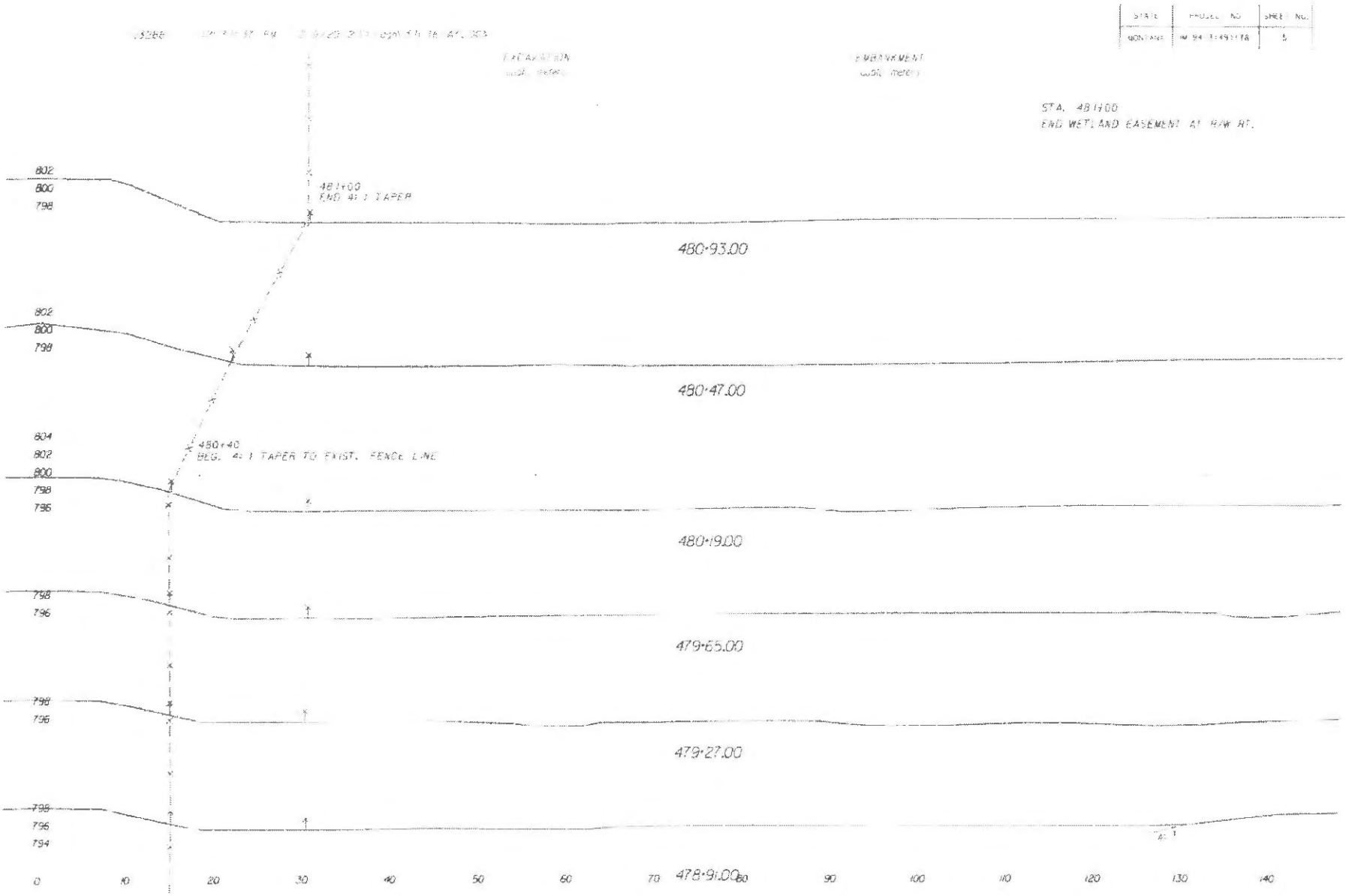
SEE STANDARD SPEC. 709 FOR FIELD COAT

B-200X
DALE DEEMING


DETAIL
AS-BUILTS
STATE
MONTANA
PROJECT NUMBER
M 94-2148(78)
SHEET NO
15
WESTBOUND I-94
EASTBOUND I-94
NEW FENCE
LEGEND
NEW WETLAND AREA
BOUNDARY OF EXIST. WETLAND AREA
EXIST. FENCE
NEW FENCE ALIGNMENT ON WESTBOUND WETLAND

STATE	PROJECT NO.	SHEET NO.
MONTANA	IM 94-3(149)178	4




STA. 481+00
END WETLAND EASEMENT AT R/W RT.
481+00
END 4:1 TAPER
480+93.00
480+47.00
480+40
BEG. 4:1 TAPER TO EXIST. FENCE LINE
480+19.00
479+65.00
479+27.00
478+91.00
802
800
798
796
794
804
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140